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IDENTIFIERS	City Colleges of Chicago IL; Tech Prep

ABSTRACT

A project to identify metalworking subsectors (multiple spindle screw machining and gears machining) for inclusion in the Manufacturing Technology Preparation Program is the subject of this report. The project accomplished the following: developed five courses in multiple spindle, secured large donations of equipment and tooling, established a core curriculum, planned inservice, developed a plan for faculty involvement in curriculum development, established entrance and exit criteria, obtained Illinois Board of Higher Education and Illinois Community College Board program approval, established supportive services for students, provided opportunities for faculty participation in industry internships, and established a plan for work-based learning experiences and mentor recruitment. Extensive appendixes include the City Colleges of Chicago board report on building renovation, Business Sector Organizing Committee minutes showing their involvement, renovation specifications, responsibilities of Director of Manufacturing Technology, report of faculty tour of multiple spindle machining facilities, recommendations for nine academic courses in the proposed Associate in Applied Science Degree, enrollment data, demographics, minutes of Articulation Planning Committee meetings, proposal to offer a bachelor's degree program in manufacturing technology, program approvals, marketing kit, review of gear manufacturing courses by industry representatives, and work-based training menu for sponsors. (YLB)

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Manufacturing Technology Continuation Project-FY 92
Richard J. Daley College
Final Report

Through grants from the Illinois State Board of Education awarded to City Colleges of Chicago (CCC) Productive Chicago, Richard J. Daley College has completed the planning and initial stages of implementing a Manufacturing Technology Tech Prep Program. The college established two main goals in Fiscal Year 91:

First, to develop a manufacturing technology Tech Prep program designed to meet industry hiring standards and enabling students to obtain transferrable competencies. Second, to assist metalworking companies to become competitive, particularly through development of human resources.

Nine (9) objectives were proposed, approved, and completed successfully during the first year representing the planning phase.

During FY 92, the second grant period, the college has completed and far exceeded the eighteen (18) objectives planned for the initial phase of implementation. To assist the readership of this report, the objectives will be italicized and results will be in regular type.

OBJECTIVES/ACHIEVEMENTS

1. *Determine the number of sub-sectors to be included in Manufacturing Technology Preparation Program (September 30, 1991).*

Through a series of meetings, it was decided that two metalworking sub-sectors would be planned and implemented--

1) multiple spindle screw machining and

2) gears machining

The Business Sector Organizing Committee (BSOC), a group of multiple spindle owners/operators submitted a business plan to the Economic Development Commission Metalworking Industry Council for approval and then to Productive Chicago of the City Colleges of Chicago. Productive Chicago received Board of Trustees approval to proceed and it was decided that Daley College would become the beacon college for Manufacturing Curriculum. (Appendix A) An I-team of Manufacturing and college and board of education staff was developed whose primary responsibility was to promote the mission of the Manufacturing Technology Program and assist in developing appropriate linkages that would strengthen the college's interactions with the private sector.

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BSOC Committee continues to meet at regular intervals to provide excellent direction to this program. This active involvement is resulting in this program to be a model industry driven program. (See Appendix B).

The sub-committees (Curriculum and Equipment Procurement) have been extremely successful in their achievements as follows:

Five (5) courses in Multiple Spindle were developed by Curriculum Committee. The courses, when developed were mailed to industry and endorsed.

The Equipment Procurement Committee has exceeded our expectations in securing large donations of equipment and tooling. The laboratory has eight (8) automatic multiple spindle machines fully operable, a number of lathes and metrology equipment.

Recognizing the immense support from Industry, the City Colleges of Chicago Board of Trustees approved renovation of 12,500 square feet (Building 300) at a cost of $452,000.00. (Appendix C and D)

2. ***Establish a core curriculum for Manufacturing Technology Preparation Program that will include the integration of academics and technical performance standards (July 30, 1991).***

In August, 1991, a Director of Manufacturing Technology was hired. Synopsis of current responsibilities and background is attached. (Appendix E) The position selection committee was composed of representation from Daley College, the Chicago Public Schools, the Illinois Institute of Technology, and Chicago Commons.

During June, 1991, the Dean of Career Programs selected faculty representing the academic and technical disciplines of the college. The academic/technical team (Appendix F) toured several multiple spindle machining facilities, was provided a full orientation of the Tech Prep concept, and was provided with an analysis of the economic strengths and weaknesses of present manufacturing competitiveness in the Chicago and suburban areas.

The team reviewed the recently updated curriculum of machining in the Chicago Public Schools as well as discussed academic approaches for improvement of entry-level workers. As a result, nine (9) academic courses were recommended for inclusion in the proposed Associate in Applied Science Degree. (See Appendix G).

In addition, the Director of Manufacturing has worked with other community colleges and universities to develop three (3) manufacturing courses as follows: Manufacturing 103--Quality Control; Manufacturing 104--Statistical Process Control; and Manufacturing 216--Computer Numerical Control. These courses will be offered in the Multiple Spindle curriculum as well as in the Automated Manufacturing curriculum when developed.

3. **Expand the Multiple Spindle Screw curriculum to include the core manufacturing technology courses. These courses will articulate to community college and reflect integration of academic courses and the performance standards, entrance and exit criteria as identified by industry (July 30, 1991).**

Chicago Commons was hired as professional and technical consultants to assist in the development of five multiple spindle courses (See Curriculum Fact Sheet--Appendix G). The courses have been endorsed by the Business Sector Organizing Committee. The industry representatives, Chicago Commons and Manufacturing Technology staff are working together to develop industry performance standards (See agenda of June 3, 1992 meeting in Appendix B).

4. ***Identify the instructors that will be involved in program delivery, including science, math and english instructors at both institutions (June 30, 1991).***

All academic courses are taught by our regular college faculty. In the Fall of 91, thirty students were provided testing and an orientation and have begun the academic component of the program. Enrollment Data and Demographics are attached (Appendix H1 and H2).

The Chicago Board of Education selected Tilden and Lane Technical Schools as the articulating partners. A series of meetings have been held at both institutions. Minutes of the meetings and also copies of the letters scheduling the Tech Prep Articulation meetings are included in (Appendix I).

5. ***Arrange a series of meetings that will promote inter-institutional and inter-disciplinary discussions and planning amongst Daley College, Curie and arrange a series of meetings between faculty and staff at Daley College, in order to promote inter-institutional and inter-disciplinary discussion and planning (September 1, 1991).***

6. *Plan with the input of CCC, CPS, faculty an in-service program that provides the opportunity for math, science, English and technical instructors at tech prep sites to observe and, were possible, obtain hands on experience at one or more manufacturing technology companies, prior to program start-up (July 1, 1991).*

7. *Develop a plan for faculty internship participants to produce curriculum, case studies, assignments, exam, etc. based on their internship experience on a continuous basis (July 1, 1991).*

The academic/technical faculty team as noted in Objective 4 have been highly active in curriculum development. (Appendix I). Several departmental self-evaluations and problem-solving concepts have been brought out as a result of the facility tours, etc. One example is the Summer Math Workshop that has been developed for incoming high school graduates. Forty two students were interviewed at three different schools. Twenty of these high school graduates are expected to participate in the program this summer (1992) as a result of our articulation activities with Lane and Tilden High Schools. Two additional high schools (Bowen and Englewood) are also submitting proposals this summer to their Central Administration to be included in the articulation efforts. We have met with both and are very receptive to their proposal.

Our progress with Tilden has far exceeded our expectations due to the fact chat they were far along in their restructuring activities as evidenced by our letter to their principal. (See Appendix J).

8. *Identify equipment and resources needed to provide quality instruction and workplace simulation (September 1, 1991).*

Through the effort of the Business Sector Organizing Committee, the college acquired large equipment donations. The Board of Trustees approved renovation of one of the campus buildings offering 12,000 square feet to the program. Renovation is now complete. The college has also taken advantage of local and out-of-town auctions to acquire a vast amount of tooling. A new Hardinage Computer Numerical Control Machine costing $63,000.00 has been purchased and is ready for installation. A computer software program "Master Key" which interfaces with the machine for CNC programming is being purchased.

9. *Determine the number of instructors and lecturers that will be needed for start-up (October 30, 1991).*

As stated, regular college faculty will teach the academic courses. Training Specialists have been identified with the assistance of industry for the specialty courses.

To assure proper preparation for start-up, the CCC Board of Trustees contracted the professional services of Chicago Commons for the purpose of continued industry direction, equipment refurbishing and set-up, the development of competency based lesson plans and materials, and student screening. (See Appendix K).

10. *Establish entrance and exit criteria as identified by industry that will accommodate preparation for entrance into a university, and matriculation into the corresponding sub-sector.*

A sub-committee of the Business Sector Organizing Committee has been appointed to develop performance standards criteria. Once developed, specialty exit examinations will be prepared. At this time, a method being suggested is to include business owners in exam administration which it is felt that their specific participation will increase the competitiveness of program graduates.

Most important in meeting this objective has been our meetings and cooperation with the Director of the Productivity Center at the Illinois Institute of Technology. The Director of Manufacturing has participated in nine (9) of the assessments of Manufacturing companies contracted by IIT. He has also kept the Director of the Productivity Center involved in our activities; ie curriculum development and faculty inservices.

Resulting from this coordination and cooperation is the intent by IIT to develop a Bachelors degree program in Manufacturing Technology. The students from Daley's program would be able to move into the bachelor's program without loss of credit in the technical areas. (Appendix L).

11. *Obtain ICCB program approval for a manufacturing technology program and Advanced certificates in the Multiple Spindle Screw sub-sectors (December 1, 1991).*

ICCB and IBHE approvals for the Manufacturing Technology Program: Multiple Spindle Machining have been received. The approvals include an AAS degree and advanced and basic certification. (See Appendix M).

12. ***Ensure full support from the high school Metalworking Advisory Council for a Manufacturing Technology Tech Prep Program (July 1, 1991).***

Meetings have been held with the Chicago Board of Education Machine Trade Advisory Council, the Board of Trustee Chairman, the former Chancellor, and Daley College staff. Recommendations included the merger of the two advisory councils and possibly the development of a city-wide metalworking council. (See Appendix N). Discussions are on-going.

13. ***Implement the marketing campaign for informing parents, students, teachers, counselors and Local School Councils about Tech Prep (September 1, 1991).***

14. ***Arrange for involvement by appropriate faculty members (September 1, 1991).***

Meetings were held at Ogilvy and Mather, a firm hired to develop marketing kit, which included representation from Productive Chicago, Chicago Public Schools, IIT Productivity Center, the Illinois State Board of Education, and Daley College staff.

In FY 92, the City Colleges of Chicago Board of Trustees approved the cost of development and printing. (See Appendix O).

The marketing kit for Manufacturing Technology was completed and hundreds of copies were distributed. (Appendix P). A second printing has been requested.

15. ***Establish supportive services for students (January 1, 1992).***

The Academic/Technical team was expanded last year to include two Counseling staff. This June, it was further expanded to include one Librarian.

Guidance and placement will be needed for students who are to be admitted directly to the Manufacturing Program with concurrent registration in general education classes. Students will be identified who are deficient in reading and math skills, pre-admitted to the program, and enrolled in the classes necessary to upgrade skills to meet educational requirements. Daley College has added two vocational counselors to the current counseling department. Both counselors have been included on the Academic Advising Team for this program.

There will be a special support service for minority students. Since one of the goals is to hire more minority setters/operators an important part of the program will be to provide counseling to students who have difficulty adapting to the traditional work ethic or the strict discipline of the school.

In addition, and in line with the State of Illinois' Building Fairness, Daley College is committed to recruiting and enrolling women in this program where women have always been in the minority. To that end, support services will be provided for women as well.

The College maintains a Coordinator for Special Needs. Students entering the program with special physical deficiencies will be counseled and assisted by our Special Needs Coordinator.

16. *Provide continuous opportunities for faculty to participate in industry internships in manufacturing technology (March 30, 1992).*

Four weeks were set aside in June, 91 to introduce academic faculty to the multiple spindle machining industry.

Two weeks in June, 92 have been utilized to introduce academic faculty to Gears Machining. These orientations and site tours have proven remarkably well. Academic faculty find the activity challenging. Administration has found their participation essential to the planning and implementation functions. The Director of Manufacturing coordinated three site tours for academic faculty (See Appendix Q).

17. *Establish a plan for the second sub-sector Gears Manufacturing (September 1, 1991).*

Obtain an articulation agreement with the high schools and a four year institution.

Establish an Implementation Team

Identify college and high school sites

The college solicited the assistance of the Illinois Institute of Technology's Productivity Center in the Planning Phase for Gears Manufacturing. The assistance received has been invaluable. The following has been accomplished:

a) An agreement has been developed to allow students to be trained on equipment housed at the IIT Productivity Center. Therefore, the

college will not have to purchase equipment which in this specialty is extremely costly.

b) An advisory committee has been developed. Members are also participants of the American Gears Manufacturing Association. (See Appendices R and S).

c) Three (3) courses have been developed along with academic courses for an Advanced and Basic Certificate in Gears Manufacturing. These courses have been reviewed by industry representatives and their suggestions are being included in the program. (See Appendices T and U).

d) The faculty Academic/Technical Team have approved the curriculum as developed.

e) The Daley College Curriculum Committee and the College Faculty Council have approved the curriculum which has been submitted to the Central Level.

Once the curriculum is approved at the central level, the college will seek ICCB and IBHE approvals. We will then proceed to provide inservices to faculty at all three levels--secondary, postsecondary, and university levels.

Meanwhile, our association with the Manufacturing Productivity Center (INFAC) must be continued, expanded, and strengthened. For further information concerning INFAC activities, see Appendices V, W, X.

18. ***Establish a plan for obtaining workbased learning experiences and recruiting mentors (December 1, 1991).***

The Business Sector Organizing Committee (BSOC) has worked with the college to develop a menu that will be utilized as a work selection guide for the Industry accepting trainees and the college. (Appendix Y). This Fall semester, 92, the college will develop a proposed contract for the Workbased Learning course--Manufacturing Technology 201. Once developed and endorsed by the BSOC, it will be submitted to our legal department and the City Colleges of Chicago Board of Trustees.

Positive Unexpected Consequences of the Project.

The Director of Manufacturing has developed and is coordinating a Customized Training Program in Manufacturing Technology. The program has been expanding more swiftly than expected due to the high demand for training of employees already in the workplace. See Summary recently prepared by the Director (Appendix Z).

Closely related is another effort to assist manufacturers' in staying competitive. This effort is a coalition of 4 community colleges and 2 universities meeting to develop an Illinois initiative for 150-9000 training. This effort is detailed in Appendix A B.

In conclusion, the college is deeply grateful for the receipt of grant funding from the Illinois State Board of Education, without which we would not have accomplished so much in so little time. We are extremely proud of our new facility and have included some photos at the back of this report.

LIST OF APPENDICES

Appendices

A---City Colleges of Chicago Board Report

B---BSOC Minutes

C---Chart C of ICCB
Application for Program Approval

D---Layout

E---Position Description/Director
of Manufacturing Technology

F---Academic Team, Roster Summer, 1991

G---Fact Sheet, Developed Fiscal Year 92

H1--Enrollment Data

H2--Demographics

I---Articulation Meeting Minutes

J---Articulation Letters

K---Board Report/Chicago Commons Contract

L---Daley College/IIT Collaboration

M---ICCB and IBHE Program Approvals

N---Notice of Meeting to merge CCC and
CPS Advisory Councils

O---Board Report--Marketing kit

P---Copy of Marketing kit

Q---Prem Sud memo/Gears Site Tours

R---Advisory Committee--Gears Manufacturing

S---Letter, Advisory Committee Minutes
Gears Manufacturing

T---Courses--Gears (Specialty)

U---Course Evaluation by Companies

V---Communication/Prem Sud--Keith McKee

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APPENDICES (CONT.)

X---Minutes, June 22, 1992, INFAC

Y---Guidelines--Workbased Learning Component

Z---Summary, Customized Training

AB---Summary, 150-9000 Training Plan

BOARD OF TRUSTEES OF COMMUNITY COLLEGE DISTRICT NO. 508
County of Cook and State of Illinois — *Appendix A*

PHASE I RENOVATION OF BUILDING 300
METALWORKING PROGRAM
DALEY COLLEGE

Fales
Fecsha
Krayze
O'Connor
"File"

TO THE BOARD OF TRUSTEES

THE CHANCELLOR

REPORTS that Board Report #15614 adopted April 5, 1991 authorized proceeding with the renovation of Building 300 at Daley College to house the metalworking program, and Board Report #15837 adopted July 11, 1991 authorized the appointment of The Austin Company as the architect to prepare the bidding documents for the renovation of Building 300; and in order to expedite the renovation work so classes can begin in January, 1992, it is necessary to fast track this project by bidding portions of the job as they are ready and by engaging the services of a construction management firm to handle the scheduling, coordination and management of the project. The project has been divided into the following bid packages:

PHASE I	PHASE II
Equipment Purchases	General Construction Work
Interior Demolition	Heating Ventilating Work
Structural Concrete Slab	Electrical Work
Roof Replacement	Plumbing Work
Site Work	

At this time the construction management and PHASE I portion of the project is being submitted; and the PHASE II portion will be submitted next month.

PHASE I

The architect, The Austin Company, has submitted a proposal for the fast tracking and construction management in the amount of $58,600.00. This is based on a fixed cost for site supervision and a variable cost of 5% based on the actual construction cost of the project, which at this time is estimated to be $452,000.00; and staff review of the cost indicates that it is within the industry standards. This cost may vary based on the actual bid prices submitted; and

that it is necessary to prepurchase the air conditioning/ventilation units for the building to insure delivery in time for installation; that the Central Office Staff has contacted Snyder General Corporation, who in the past has supplied air conditioning and ventilation equipment for the District, thereby saving the usual contractor and distributor markups; and Snyder General Corporation has agreed to furnish this equipment on a direct basis at a cost of $30,429.00; and staff review of the cost indicates that it is within the industry standards; and

that bid specifications were prepared by the architects for Interior Demolition, Roof Replacement, Structural Concrete Slab, and Site Work, and were publicly advertised as required by law with the following results:

600

INTERIOR DEMOLITION:

45 notices sent to firms on the CCC bidders' list.
15 firms requested specifications.

Bid results:

Company	Amount
Bradley Construction Dolton, Illinois	$87,400.00
Century Contractors Bedford Park, Illinois	$48,000.00
Golconda Oak Brook, Illinois	$74,989.00
Heritage of Chicago Chicago, Illinois	$32,000.00
Oakley Construction Chicago, Illinois	$68,000.00
R&W Clark Constructioon Chicago, Illinois	$130,000.00

4 "NO BID" Responses

that the Office of Contract Compliance has stated that Heritage of Chicago, Chicago, Illinois is in compliance with the M/WBE requirements of this project.

ROOF REPLACEMENT:

44 notices sent to firms on the CCC bidders' list.
16 firms requested specifications.

Bid results:

Company	Amount
Active Roofing Hickory Hills, Illinois	$52,937.00
Bennett & Brouseau Kankakee, Illinois	$66,000.00
Century Contractors Bedford Park, Illinois	$97,520.00

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Heritage of Chicago Chicago, Illinois	$62,000.00
Knickerbocker Roofing Harvey, Illinois	$84,000.00
James Mansfield Roofing Lyons, Illinois	$59,000.00
M.W. Powell Roofing Chicago, Illinois	$59,221.00

2 "NO BID" Responses

that the Office of Contract Compliance has stated that Active Roofing Hickory Hills, Illinois is in compliance with the M/WBE requirements of this project.

STRUCTURAL CONCRETE SLAB:

92 notices sent to firms on the CCC bidders' list.
24 firms requested specifications.

Bid results:

Company	Amount
Bradley Construction Dolton, Illinois	$43,1000.00
Century Contractors Bedford Park, Illinois	$79,900.00
Civiltechniks, Inc. Chicago, Illinois	$75,000.00
Golconda Oak Brook, Illinois	$79,983.00
G.F. Structures Chicago, Illinois	$53,776.00
Heritage of Chicago Chicago, Illinois	$36,000.00
Oakley Construction Chicago, Illinois	$49,152.00
R&W Clark Construction Chicago, Illinois	$52,000.00

6 "NO BID" Responses

that the Office of Contract Compliance has stated that Heritage of Chicago, Chicago, Illinois is in compliance with the M/WBE requirements of this project.

9-5-91

#16009

600

SITE WORK:

100 notices sent to firms on the CCC bidders' list.
18 firms requested specifications.

Bid results:

Company	Amount
Bradley Construction Dolton, Illinois	$21,600.00
Century Contractors Bedford Park, Illinois	$25,000.00
Civiltechniks Chicago, Illinois	$45,000.00
G.F. Structures Chicago, Illinois	$35,936.00
Heritage of Chicago Chicago, Illinois	$21,000.00
Oakley Construction Co. Chicago, Illinois	$21,800.00

6 "NO BID" Responses

that the Office of Contract Compliance has stated that Heritage of Chicago, Chicago, Illinois is in compliance with the M/WBE requirements of this project.

THE CHANCELLOR

RECOMMENDS that the Board of Trustees approve the issuance of a purchase order or addendum to the below-listed recommended contractors for each bid package on the Building 300 renovation at Daley College; and if any of the below listed Contractors defaults on the project, the Chancellor is authorized to award the contract to the next low bidder:

- An addendum to The Austin Company for construction management in the amount of $58,600.00, increasing the original purchase order to $100,960.00 in accordance with their proposal dated August 15, 1991.
- A purchase order to Snyder General Corporation, Chicago, Illinois, in the amount of $30,429.00 for the air conditioning equipment in accordance with their proposal dated August 26, 1991.
- A purchase order to Heritage of Chicago, Chicago, Illinois, in the amount of $32,000.00 for the interior demolition in accordance with the specifications dated August 7, 1991.

9-5-91

- A purchase order to Active Roofing, Hickory Hills, Illinois, in the amount of $52,973.00 for the roof replacement in accordance with the specifications dated August 7, 1991.

- A purchase order to Heritage of Chicago, Chicago, Illinois, in the amount of $36,000.00 for the structural concrete slab in accordance with the specifications dated August 7, 1991.

- A purchase order to Heritage of Chicago, Chicago, Illinois, in the amount of $21,000.00 for the site work in accordance with the specifications dated August 7, 1991.

FINANCIAL Charge to: 23-2095-59-71.

Respectfully submitted,

Nelvia M. Brady
Chancellor

Approved by:

Laurence B. Stanton
Vice Chancellor

Robert C. Rogers
Executive Vice Chancellor

William Conway, President
Daley College

September 5, 1991

17 #16009

Appendix B

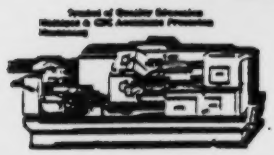
MEMORANDUM

TO: **Metal-Working Owners/Managers**

FROM: **Neil Burke, Project Director**

DATE: **June 22, 1992**

RE: **JULY 8, 1992 BSOC MEETING**



The Business Sector Organizing Committee Chairmen,

Chicago Commons Association & Richard J. Daley College Staff

INVITE YOU TO:

The eleventh BSOC meeting for the Multiple Spindle Training Program (MSTP). The meeting will be held July 8th at Richard J. Daley College (building 300), 7500 South Pulaski Road, Chicago Illinois. The decision to schedule this meeting was made by the BSOC representatives who attended the June 3rd BSOC meeting.

July 8 Meeting AGENDA:

1. **Review electrical progress requested by city inspectors.**
2. **Review progress of industry developed performance standards.**
3. **Review CNC development progress and revise where necessary.**

There has been significant MSTP progress since the first Industry meeting was held June 26 1990. Apprentices began training June 3, 1992 on both day and evening schedules. The MSTP staff is quite pleased with the apprentices progress to date. The detailed lesson plans portion of the industry-driven MSTP curriculum has been updated since the June 3 MSTP meeting. Many additional very generous industry donations have been acquired; (New Britain multiple spindle automatic screw machine - manager Jerry Benish and owner Bernard Bertsche of Camcraft). Hardinge CHNI CNC automatic bar turning chucker teacher tapes and machine attachments, manager Mark Brooks, Terry and Jerry Iverson owners of Iverson & Company. Fifty allen wrench sets for apprentices use, Richard Payne owner of Safety Socket.

PLEASE MARK YOUR CALENDARS: **DATE: JULY 8, 1992 (Wednesday)**

TIME: 5:30 PM (LIGHT BUFFET)

LOCATION: Daley College, 7500 South Pulaski Road
Chicago, IL (building 300)

Chicago Commons Association's Industrial and Business Training Programs
AUTOMATIC SCREW MACHINE • PLASTIC INJECTION MOLDING • INDUSTRIAL INSPECTION • PACKAGING/MAINTENANCE
Employment Training Center
4100 West Belmont Avenue • Chicago, Illinois 60641-4616 • Administrative Offices 312/685-1010

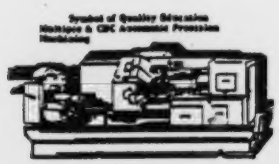
MEMORANDUM

TO: **Metal-Working Owners/Managers**

FROM: **Neil Burke, Project Director**

DATE: **June 22, 1992**

RE: **JULY 8, 1992 BSOC MEETING**



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PLEASE MARK YOUR CALENDARS: **DATE: JULY 8, 1992 (Wednesday)**

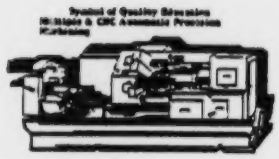
TIME: 5:30 PM (LIGHT BUFFET)

LOCATION: Daley College, 7500 South Pulaski Road
Chicago, IL (building 300)

This is the third MSTP meeting held inside building 300.

Specific items needed to further develop the MSTP project:

1. Two B model Davenport multiple spindle automatic screw machines.
2. Two reel type Acme-Gridley automatic screw machines of 1-1/4 inch or smaller capacity.
3. Odd lots of bar materials.
4. Greenlee, Acme, Davenport and New Britain spindle and feed gears.
5. New Britain machining holders and feed push tubes.
6. Miscellaneous reamer, drill and cutting holders for all four types of equipment.
7. Upright steel cutting saw.
8. Bar end pedestal grinder.



The Business Sector Organizing Committee,

Chicago Commons Association & Richard J. Daley College Staff

June 3 Meeting AGENDA:

1. Special grant to place potential future apprentices in machine shop's during summer months. (Dr. Knazze)

2. Review, modify and vote to approve (acceptable portions) industry developed performance standards.
(Neil)

3. Design an organized method to monitor industry curriculum performance standards. (Ric)

4. Program problems.
4a. Equipment - UL approval (city inspectors). (Neil or President Conway)
4b. Instructor/s and developer/s finances. (Ric or Hill)

4. Review CNC development progress and revise where necessary. (Dr. Knazze)

Specific items needed to further develop the MSTP project:

1. Two B model Davenport multiple spindle automatic screw machines.

2. Two reel type Acme-Gridley automatic screw machines of 1-1/4 inch or smaller capacity.

3. Odd lots of bar materials.

4. Greenlee, Acme, Davenport and New Britain spindle and feed gears.

5. New Britain machining holders and feed push tubes.

6. Miscellaneous reamer, drill and cutting holders for all four types of equipment.

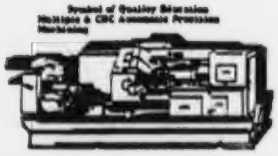
MEMORANDUM

TO: **Metal-Working Owners/Managers**

FROM: **Neil Burke, Project Director**

DATE: **May 19, 1992**

RE: **JUNE 3, 1992 BSOC MEETING**



The Business Sector Organizing Committee Chairmen,

Chicago Commons Association & Richard J. Daley College Staff

INVITE YOU TO:

The tenth BSOC meeting for the Multiple Spindle Training Program (MSTP). The meeting will be held June 3rd at Richard J. Daley College (building 300), 7500 South Pulaski Road, Chicago Illinois. The decision to schedule this meeting was made by the BSOC chairmen; Jay Kirby / Austin Consulting Division (BSOC chair) - Norris Freedman / Perfection Screw (Curriculum chair) - Steve Lucas / Elk Grove Industrial Supplies (Site & Location chair) and Mike Richmond / Richmond Machinery (Equipment Acquisition chair).

June 3 Meeting AGENDA:

1. **Design an organized method to monitor industry curriculum performance standards.**

2. **Review, modify and vote to approve (acceptable portions) industry developed performance standards.**

3. **Review CNC development progress and revise where necessary.**

There has been significant MSTP progress since the first Industry meeting was held June 26 1990. Apprentices are scheduled to begin training June 3, 1992 on both day and evening schedules. The industry-driven MSTP curriculum has been further developed to include detailed lesson plans and performance standards. Many additional very generous industry donations have been acquired.

PLEASE MARK YOUR CALENDARS: **DATE: JUNE 3, 1992 (Wednesday)**

TIME: 5:30 PM (LIGHT BUFFET)

LOCATION: Daley College, 7500 South Pulaski Road
Chicago, IL (building 300)

This is the second MSTP meeting held inside building 300.

Specific items needed to further develop the MSTP project:

1. Two B model Davenport multiple spindle automatic screw machines.
2. Two reel type Acme-Gridley automatic screw machines of 1-1/4 inch or smaller capacity.
3. Odd lots of bar materials.
4. Greenlee, Acme, Davenport and New Britain spindle and feed gears.
5. New Britain machining holders and feed push tubes.
6. Miscellaneous reamer, drill and cutting holders for all four types of equipment.

24 November 1991

Dear Metal-Working Owners/Managers:

I would like to invite you to the eighth meeting of the Business Sector Organizing Committee (BSOC) for the Multiple Spindle Training Program (MSTP). The meeting will be held December 4 at Austin Consulting Division, 9801 W. Higgins in Rosemont IL. The decision to schedule this meeting was made by the BSOC chairmen; Jay Kirby - Austin Consulting Division (BSOC chair) Norris Freedman - Perfection Screw (Curriculum chair) and Steve Lucas - Elk Grove Industrial Supplies (Site & Location chair).

Building 300 at Daley College is to be the site for the MSTP; the building rehab is almost complete. This program is intended to lead the way for future joint venture, industry-driven programs; the MSTP is a joint development of the BSOC, City Colleges of Chicago and Chicago Commons Association's division of Industrial and Business Training Programs.

December 4 Meeting AGENDA:

1. Formalize inclusion of 9 academic Manufacturing Technology courses with the MSTP curriculum designed and approved by BSOC owners/managers.

2. Develop Industry-designed and monitored performance standards.

3. Officially establish an Equipment Committee.

There has been significant MSTP progress since the first Industry meeting was held June 26 1990. Approximately one million dollars has been allocated by the City Colleges of Chicago for the renovation of Daley College building 300 to house MSTP and the purchase of additional attachments, tooling and materials not expected to be acquired through industry donations. The industry-driven MSTP curriculum has been submitted to ICCB for approval. Many very generous industry donations have been acquired. A temporary storage facility made available by Mr. Ron Gidwitz (President of Helen Curtis, Chairman of the City of Chicago's Economic Development Commission and President of Board of Trustees, City Colleges of Chicago) is still being utilized until Building 300 renovation is complete at Daley College.

Several decisions will be made at this meeting; needless to say your attendance is crucial.

PLEASE MARK YOUR CALENDARS: **DATE: 4 DECEMBER 1991**

TIME: 5:30 PM (LIGHT BUFFET)

LOCATION: Austin Consulting Division,
9801 W. Higgins Rd. Rosemont IL

Looking forward to seeing you at the meeting!

Respectfully yours,

John J. (Jay) Kirby, III
Chairman, Business Sector Organizing Committee

Enclosures: Map & Course Outline

MEMORANDUM

TO: **Metal-Working Owners/Managers**

FROM: **Neil Burke, Project Director, Automatic Machining**

DATE: **November 24, 1991**

RE: **DECEMBER 4, 1991 BSOC - MSTP MEETING**

MSTP

PROGRESS:

Machinery:

Many industry donations and large purchases made by City Colleges of Chicago at a recently held auction (Stewart-Warner) has produced a soon to be well equipped training facility.

Although we still need to make other additional purchases and have need for many other donations, the area we are weakest in is numbers of multiple spindle screw machines.

Four machines have been donated to date; Bodine Electric - Panek Precision - Safety Socket have been the in kind donors of multiple spindle automatic screw machines. City Colleges purchased two at the Stewart-Warner auction, that brings the total to six. Acme-Gridley and Davenport are the most difficult machines to acquire. Any leads or assistance you can lend in this area will be greatly appreciated.

Building 300:

Rehab work of Daley College building 300 is moving ahead at rapid pace and is scheduled for completion on or before December 31, 1991. Mr. Robert Dompke, Director of Building and Grounds, City Colleges of Chicago is in charge of building completion and is working with the Austin Consulting Company on this project. By mid December 91 the process of moving acquired equipment into building 300 will begin.

Curriculum:

The MSTP curriculum as designed and approved by industry Owners/Managers has been submitted to the Illinois Community College Board (ICCB) for approval. Nine academic courses have been made available for apprentices desiring an AAS Degree (associates in applied science).

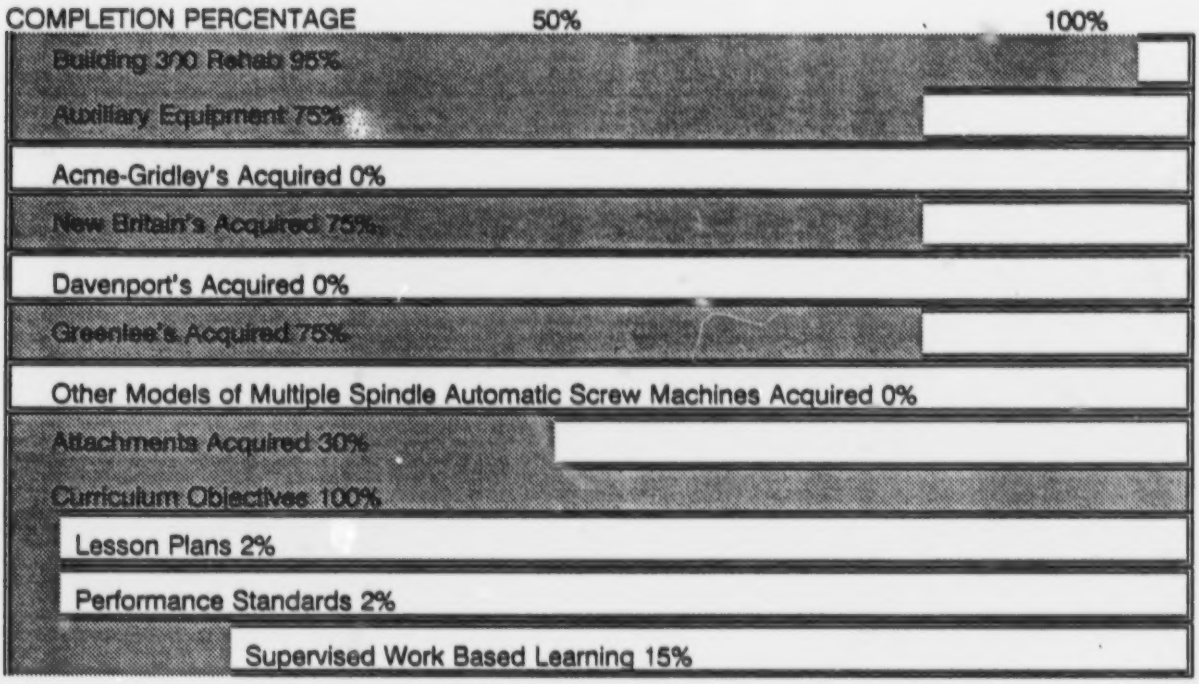
Daley College is presently working towards computer numerical control (CNC) education. Shop Owners/Managers interested in assisting with the design of CNC training should also attend this December 4 meeting. Daley College representatives are very serious about this subject and have investigated the purchasing of CNC equipment.

College representatives have taken steps to develop a link between the high schools and Daley College's Manufacturing Technology education. This project is called 2+2, two years high school and two years college education in metal-working.

Enclosed is the course description of the Manufacturing Technology education program that has been submitted to the ICCB for approval. We will appreciate your personal review of the material and would like to formalize the course outline at the December 4 meeting.

SEE CHARTED PROGRESS ON REVERSE SIDE OF THIS PAGE

GRAPH PROGRESS REPORT



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APPENDIX 12

RICHARD J. DALEY COLLEGE
OFFICE OF CAREER PROGRAMS

Manufacturing Technology AAS Degree 62 Credit Hours
(Multiple Spindle Option)

1st Semester	Cr.Hrs.	3rd Semester	Cr.Hrs.
English 101	3	Business 111	
*Mathematics 107	5	(Introduction to Business)	3
Mechanical Technology 101		-or-	
(Manufacturing Processes)	3	Philosophy 216	
Engineering 131	3	(Critical Thinking)	
Social Science 101 or 102	3	Mechanical Technology 170	
		(Computer Aided Design 1)	3
*Math 107 has to be the		-or-	
5 credit hour option		Manufacturing Technology 216	
		Manufacturing Technology 104	
		(Statistical Process Control)	3
		Manufacturing Technology 114	
		(Multiple Spindle 4)	7
	17		16

2nd Semester	Cr.Hrs.	4th Semester	Cr.Hrs.
Manufacturing Technology103		Manufacturing Technology 201	
(Intro. to Quality Control)	3	(Supervised Work Based Learning)	3
Manufacturing Technology 111		Manufacturing Technology 215	
(Multiple Spindle 1)	3	(Multiple Spindle 5 - Adv.)	6
Manufacturing Technology 112		Business 111	
(Multiple Spindle 2)	2	(Introduction to Business)	
Manufacturing Technology 113		-or-	3
(Multiple Spindle 3)	6	Philosophy 216	
Speech 101	3	(Critical Thinking)	
	17		12

Manufacturing Technology Advanced & Basic Certificates
(Multiple Spindle Option)

Advanced Certificate	Cr.Hrs.	Basic Certificate	Cr.Hrs.
English 101	3	English 101	3
*Mathematics 107	5	*Mathematics 107	5
Mechanical Technology 101		Manufacturing Technology 111	
(Manufacturing Processes)	3	(Multiple Spindle 1)	3
Manufacturing Technology 111		Manufacturing Technology 112	
(Multiple Spindle 1)	3	(Multiple Spindle 2)	2
Manufacturing Technology 112		Manufacturing Technology 113	
(Multiple Spindle 2)	2	(Multiple Spindle 3)	6
Manufacturing Technology 113		Manufacturing Technology 114	
(Multiple Spindle 3)	6	(Multiple Spindle 4)	7
Manufacturing Technology 114			
(Multiple Spindle 4)	7	*Math 107 has to be the	
Multiple Spindle 215		5 credit hour option	
(Multiple Spindle 5)	3		
Manufacturing Technology 201			
(Supervised Work Based Learning)	3		
*Math 107 has to be the			
5 credit hour option	38		26

Summary of meeting results - (months) June through November 1990
Partial history inserted.

First mass mailing:
Mid June 1990, a mass mailing was sent to 240 metropolitan area screw machine shops announcing a meeting to be held cn June 26. Purpose of meeting was to determine whether or not there existed a sincere interest in developing a multiple spindle automatic screw machine program.

*FIRST MSTP MEETING:
June 26, 1990 the first meeting held at the Golden Flame Restaurant 6 PM, which started the official development of MSTP. A decision was made by group consensus that the development of MSTP is needed and seven business firms volunteered to be a committee and work towards that goal. Twenty six representatives attended this meeting; representing business, training and economic development branches of government and Chicago Commons Association. The development of MSTP is spearheaded by Chicago Commons Association's, Industrial and Business Training Programs Division in cooperation with the City of Chicago's Economic Development Commission and the Commissions Metal Working Industry Council. A future meeting date was set for August 14, 1990 to be held at Austin Consulting Division, 9801 W. Higgins Rd.

Second mass mailing:
July 17, 1990 a second mass mailing was sent to 240 screw machine shops announcing a summary of the June 26 meeting. The following is an excerpt of that mailing.

Several issues were discussed and some decisions made regarding this prospective training program. There was general agreement among the company owners/managers that there has been and continues to be a need for a training activity focussed on the multiple spindle segment of the screw machine products industry. Seven company owners and representatives volunteered to work as the Organizing Committee and agreed to take on the following tasks:

1. Locate and acquire equipment to be used for the training program.
2. Locate and acquire tools and material for training.
3. Locate and acquire a site suitable for access by both companies and prospective trainees.
4. Develop curriculum for the training program.

*SECOND MSTP MEETING:
August 14, 1990 was the second MSTP meeting; twenty representatives attended, held at Austin Consulting 6 PM. The consensus was to develop a business plan to be submitted to the Economic Development Commissions Metalworking Industry Council for approval and then sent to the City College's Productive Chicago; ie: a preliminary concept paper was mailed on August 27, to all MSTP participants and a revised version mailed on September 19. A decision was made to train on three types of multiple spindle screw machines, Davenport, Acme Gridley and New Britain which would cover both the five and six spindle sectors of the screw machine trade. The decision was to have the multiple spindle program be a pilot program with others to follow. Another meeting was scheduled for Sept.25 at Austin Consulting.

*THIRD MSTP MEETING:

September 25, 1990 was the third MSTP meeting; attendance of 14 held at Austin consulting 6 PM. Sandy Filion Foster of Productive Chicago presented information of which she felt would help the MSTP; and would work though the City Colleges of Chicago. She suggested the possibility of College space and monetary support for MSTP development and that another meeting was scheduled for Oct 9th on the industry issue. Followed there was discussion about a similar program which failed at Triton College, and that we should not make the same mistakes. There was agreement to pursue the City College direction. Considerable discussion was held concerning how to incorporate production experience in the MSTP. One owner offered to bring apprentices into his shop for a two week period as one potential solution. Some owners\managers felt production in the school might be a workable solution; possibility producing a product which is not in direct competition with other shops. No finale decision was made on this issue. Curriculum was prioritized at this meeting, the following is an excerpt from a follow up flyer that was mailed to MSTP participants:

EXCERPT FROM FLYER dated Nov. 23, 1990

Curriculum development was prioritized at the Sept.25 meeting; the Project Coordinator, Neil Burke, is to put together a rough draft of the curriculum and contact committee volunteers to fill in actual training specific needs. Neil will then re-format the curriculum based on what company personnel tell him.

The discussion then went to developing a floor layout plan of MSTP, Austin Consulting offered to help with this project in coordination with the project coordinator and the City Colleges. The last item discussed was the need for MSTP participation on the Metalworking Industry Council which resulted in several volunteers. The next meeting date was scheduled for December 4, 1990.

Summary minutes prepared by Neil Burke - Dec. 4, 1990.

Summary of meeting results - (months) January through June 1991

*FORTH MSTP MEETING:

December 4, 1990 was the forth MSTP meeting held by BSOC at Austin Consulting, thirteen representatives attended this meeting. A BSOC Chairman, BSOC Co-Chairman, BSOC curriculum Chairman, and a BSOC site and location Chairman were officially elected at this meeting. The machine donations offered by President/Owner, Richard Payne, Safety Socket were discussed and approved suitable for training purposes. Mr. Freedman, curriculum chairman agreed to convene a sub-committee to review, revise, modify, and correct the remaining questions regarding the present status of the MSTP curriculum. Mr. Lucas took the responsibility to review building 300 of Daley College and report it's suitability status to BSOC at the next scheduled BSOC meeting. Support services were added to the curriculum at this meeting.

FIFTH MSTP MEETING - SUB COMMITTEE CURRICULUM:

January 11, 1991 was the fifth meeting which involved four representatives to correct the remaining curriculum issues. The committee met for four hours and voted to recommend to BSOC, the few changes which were found necessary to modify.

*SIXTH MSTP MEETING:

February 12 1991 was the forth meeting held at Austin Consulting Division and seven representatives attended. The meeting concentrated on four issues; curriculum, recruiting, public relations, and the renovation status of building 300 of Daley College.

The committee instructed Neil Burke to put forth more effort on specific issues.

1. To ensure the building renovation could be moved forward at a reasonable pace to ensure program start up by September 1991.
2. To work towards public relations in an effort to let others know that the development of MSTP was being pursued.
3. To contact Shirley Knazze, Dean of Curriculum to see if she could work with me or supply another curriculum specialist to assist in the curriculum development.

There was not a future meeting predetermined at this juncture.

SEVENTH MSTP MEETING - BSOC CHAIRMAN:

May 22, 1991 the Chairman of the Business Sector Organizing Committee (BSOC) Jay Kirby of Austin Consulting called a meeting of the three BSOC Chairman along with Chicago Commons staff and two potential instructors. There were eight representatives present in total at this meeting.

Main points of the agenda were to review the qualifications of instructor candidates and a recommendation was made to address the Daley College to hire the candidates for both instruction of MSTP and development work of MSTP.

The issue of an internship was discussed at length and a decision reached to call a full meeting of the BSOC and see if it could be held at the Daley College. The target date selected was June 26 1991 which was a one year anniversary date for the official starting date of MSTP development by the BSOC.

*EIGHTH MSTP MEETING:

June 26, 1991 held in the Daley College cafeteria and twenty representatives attended this meeting.

Excerpt from the June 26 agenda flyer;

1. Curriculum:

   An updated version of the Multiple Spindle Automatic Screw Machine Apprentice Trades Training Program (MSTP) curriculum will be made available to those in attendance at the June 26, 1991 meeting held at Daley College. We would mail the curriculum, except the cost to do so would be quite high. Industries continued review and revisions of this curriculum is essential to maintaining this industry driven curriculum status.

2. Internship:

   Enclosed is a rough draft which suggests an avenue of approach to include an internship into the MSTP curriculum. Industry internship design and control of this issue is of extreme importance to insure the success of this venture.

3. Pilot Program:

   The MSTP is a pilot program; it's intent is to lead a process which will stimulate similar developments of many other metal-working sub-sectors. The initial target of MSTP concentrates on apprenticeships; with advanced journey/person training and other

activities which should induce economic competitiveness to soon follow.

4. Decisions:

Decisions will be by vote; some decisions which need to be made are as follows:

A. To decide: The MSTP shall incorporate internships as an integral part of the training program - discussion led by Ric Gudell

B. Internships - What are They? What's the Idea?

a. Draft Internship Agreements
b. Student responsibilities
c. Employer responsibilities
d. School responsibilities
e. Insurance

5. More Decisions:

A. To decide: The MSTP shall incorporate Performance Standards as an integral part of certifying graduates of training - discussion led by Ric Gudell

B. Performance Standards - What are They? What's the Idea?

a. Draft Sample Performance Standard
b. Employer responsibility
c. Student responsibility
d. The Standard

The meeting discussed at length the development of an internship to be included with MSTP. The details of working out the existing problems was left to a sub-committee which was selected from those in attendance. The main two concerns were insurance when an apprentice is on a shop site and how to develop a menu for employers to choose from. Steve Lucas, Elk Grove Industrial Supplies, was selected to convene the sub-committee. This work was to be accomplished with in three weeks and then the BSOC was to be scheduled to meet again at Daley College and notified of the date. The BSOC committee voted to approve the curriculum that was presented at the meeting which had few changes since it had last been reviewed by the committee.

The committee instructed Neil Burke to put more effort into the acquiring of equipment and suggested a list of equipment needed be included with the next MSTP mailing.

NINTH MSTP MEETING - SUB COMMITTEE OF INTERNSHIP:

July 2, 1991 a sub-committee of BSOC met and four representatives attended this meeting. The two issues of concern were insurance of apprentices when on a shop site and a menu for owners/managers to select from when agreeing to participate in an internship agreement.

The central office of the City College's of Chicago was contacted to find out the particulars of insuring apprentices on shop sites. It appeared this is achievable. The menu problem was resolved by instructing Neil Burke to take the task objectives from the MSTP curriculum and formulate them into an internship menu.

Summary of minutes prepared by Neil Burke - July 25, 1991.

Summary of meeting results - (months) July through September 1991

*TENTH MEETING OF MSTP

August 28,1991 the business sector organizing committee (BSOC) met at Daley College in room 2101, time 5:30 P.M. light buffet and 6:00 P.M. meeting began.

Excerpt from meeting announcement flyer:

Agenda Points:

1. Review internship menu.
2. Make menu revisions where necessary.
3. Develop procedures for singing up volunteer companies to work with apprentices in the first and/or second quarter of 1993.

An additional agenda point was submitted by Mike Richmond from Richmond Machinery.
Agenda point: Organized machinery acquisition plan.

The internship menu was reviewed and adopted with out changes.
Dr. Knazze raised a question about the name internship versus work based learning and it was agreed that work based learning is more appropriate. Any subsequent material will reflect this change.

General consensus was reached on signing up companies for work based learning which was to start with companies who are more familiar with what it is all about and use their singed agreements as a tool to sign up other companies. It was suggested that Neil meet with Dr. Knazze to establish exactly when the work based learning period will actually begin.

It was suggested that a new sub-committee be established to meet and design an organized machinery acquisition plan. Mike Richmond, Steve Lucas, Otto Gassman and Norris Freedman volunteered from the business sector to do this with Neil Burke and Ric Gudell from Chicago Commons. Mike offered the use of his business site as the place to hold the meeting and Neil was assigned to contact volunteers and set a mutually agreeable date for the meeting with in a week or two.

Eleven representatives attended the August 28th meeting; representing five different entities; Daley College, Economic Development Commission, Department of Economic Development, Chicago Commons and the Business Sector. The business sector has continued to have an excellent wide range of representation; owners of multiple spindle shops, tooling sales representation, industry consultants, machinery sales owners are the sectors most regularly represented. This representation has continued to provide a broad spectrum of the machine industry.

The meeting adjourned at about 7:30 P.M.

ELEVENTH MEETING OF MSTP - SUB COMMITTEE MEETING OF EQUIPMENT ACQUISITION

September 16, 1991 four representatives attended a meeting held at Richmond Machinery; hosted by owner Mike Richmond to discuss methods that might speed up equipment acquisitions. The meeting lasted about two and one half hours. At the conclusion Mike agreed to submit a list of equipment that MSTP needs which he has in stock. Mike will reduce costs if the City Colleges choose to purchase from his business. Additionally Mike will deliver a list of contacts to Chicago Commons office of places that the many other needed items can be

purchased for reasonable prices. Mike will also use his influence to have such prices further reduced and push for donations. Mike is considering some donations from his business but needs to convince his brother first (his brother is a partner). Otto Gassman also has contacts and agreed to supply those also.

Summary of minutes prepared by Neil Burke - September 23, 1991.

*TWELFTH MEETING OF MSTP

December 4, 1991 nine representatives attended the eighth BSOC committee meeting held at Austin Consulting Division (9801 W. Higgins Rd.). Dr. S. Knazze described the work that went into bridging the academic and technical curriculum and the results as presented to ICCB. A motion was made to approve the addition of the academic portion of metal working curriculum into the MSTP curriculum and motion passed unanimously.

Mr. Hain, Vice President of Astra Precision Products Inc. explained the German method of determining performance standards (verbal/written tests and tests on the machines) before an industry diploma can be issued. He suggested that his company's job descriptions be used as a starting point to set up industry performance standards. Mr. Kirby, the BSOC Chairman suggested that Burke meet with Astra Precision staff and start a process similar to the process Burke followed on MSTP Industry curriculum development. It was suggested that the Local Chapter of Screw Machines and the Tooling Manufacturing Association be brought up to date on MSTP progress; that this might be done with a cover letter from the MSTP-BSOC. Machining magazines such as Automatic Machining and American Machinist be sent an article to print that explains the MSTP program and the programs specific donation needs. Ms. Mueller from E.C. Industrial Report offered to take the lead on this process.

Mr. Richmond from Richmond Machinery was nominated for Equipment Acquisition Chairman of BSOC and motion made and passed. It was suggested that a Sub-Committee meeting be set up for the purpose of addressing the need for additional donations. Mr. Mayer offered to work on the sub-committee and Burke volunteered Mr. Lucas and Mr. Freedman and agreed to contact them to set a potential meeting date.

Meeting adjourned 7:45 PM.
Minuets prepared by Neil Burke Dec. 5, 1991.

*THIRTEENTH MEETING OF MSTP

February 26, 1992 seventeen representatives attended the ninth business sector organizing committee meeting (BSOC). Excerpt from Feb 26 meeting announcement:

February 26 Meeting AGENDA:

1. Design and implement an organized procedure for obtaining additional Multiple Spindle Equipment.

2. Continue developing Industry-designed and monitored performance standards.

3. Develop CNC curriculum objectives.

Discussion (agenda point 1) Mr. Kirby (Austin Consulting) agreed to contact American Machinist

Magazine as a back up to help insure there printing an article submitted jointly by committee members (Susan Mueller & Neil Burke). Ms. Mueller and Mr. Richmond agreed to contact a reporter at the Tribune headquarters who Mr. Richmond knows.

(agenda point 2) Substantial discussion was held concerning procedures to establish and monitor industry curriculum standards. It was agreed that BSOC members would review the draft curriculum that the curriculum consultants were preparing and add, delete and otherwise revise as necessary the curriculum detailed lesson plans as it is developed. This approach is quite similar to that used when the initial learning objectives were developed. Additionally volunteer industry personnel to monitor apprentices progress on campus or possibly off campus was considered to have feasible potential. It was suggested that more time be given for representatives to think this issue through more clearly. Mr. Gudell had prepared a draft for performance standards and presented copies for the committee (draft dated Feb 25, 92). Mr. Gudell made a presentation on the issue.

(agenda point 3) During the discussion of adding CNC training along with the multiple training the concern of investment into multiple training was raised. The conclusion being that if an apprentice is really only interested in CNC that there appears to be nothing objectionable to the inclusion of CNC. However industry at present would not like multiple training steered extensively towards CNC personnel. In other words, industry finds they have a more difficult time training multiple than CNC.
Discussion was held on CNC training difficulties versus EDC and CNC milling training. In essence it was that there is more involved in automatic machining CNC training than any other metal working computerized training.

Other meeting points of interest: A demonstration was given of one multiple spindle automatic screw machines operation. A few piece parts were produced during the demonstration for the benefit of those who were not familiar with the operation of multiple spindle automatic bar turning machines.

Two honor presentations were made to the Dean of Curriculum (Daley College) Dr. Knazze for outstanding program development performance. One presentation was made in behalf of the Business Sector Organizing Committee (BSOC) by BSOC chairman Jay Kirby (Austin Consulting) and another by Ric Gudell, Director (Chicago Commons) in behalf of Chicago Commons Industrial & Business Training Programs division.

CHART B1: Minimum Qualifications of Reassigned Faculty NOT APPLICABLE

	Degree	Field	Years of Related Occupational Experience	Years of Teaching Experience	Faculty Status Full-time/ Part-time	Previous Teaching Area
1.						
2.						
3.						
4.						

Total Reassigned FTE Faculty _____

CHART B2: Minimum Qualifications Sought for New Faculty

	Degree	Field	Years of Related Occupational Experience	Years of *Teaching Experience	Faculty Status Full-time/ Part-time
1.		Multiple	Minimum of	Minimum of	full-time
2.		Spindle	10 years	5 years	
3.		Setter/Operator			
4.					

Total New FTE Faculty 2 *supervisory

CHART C: Program Physical Facilities

	Net Square Feet		Number of Rooms		Total Seating Capacity	
	New/ Modified	Present	New/ Modified	Present	New/ Modified	Present
Classroom space	750					
* Laboratory space	9,300		1		25/30	
** Library space						
Office space	250					
*** Other (specify)	1,046					

Total cost of new or modified facilities: $452,000.00 Estimate

Source of Funding: Public Building Commission

Date of New Space Availability: January 1, 1992

*Includes Tool Crib of 25 sq. ft.

** Located in main building.

*** Administrative Area (300 s.q.), Janitors' Closet (60 s.f.), Storage (36 s.f.) Washrooms & Lockers (650 s.f.)

Also see Appendices 14 and 15.

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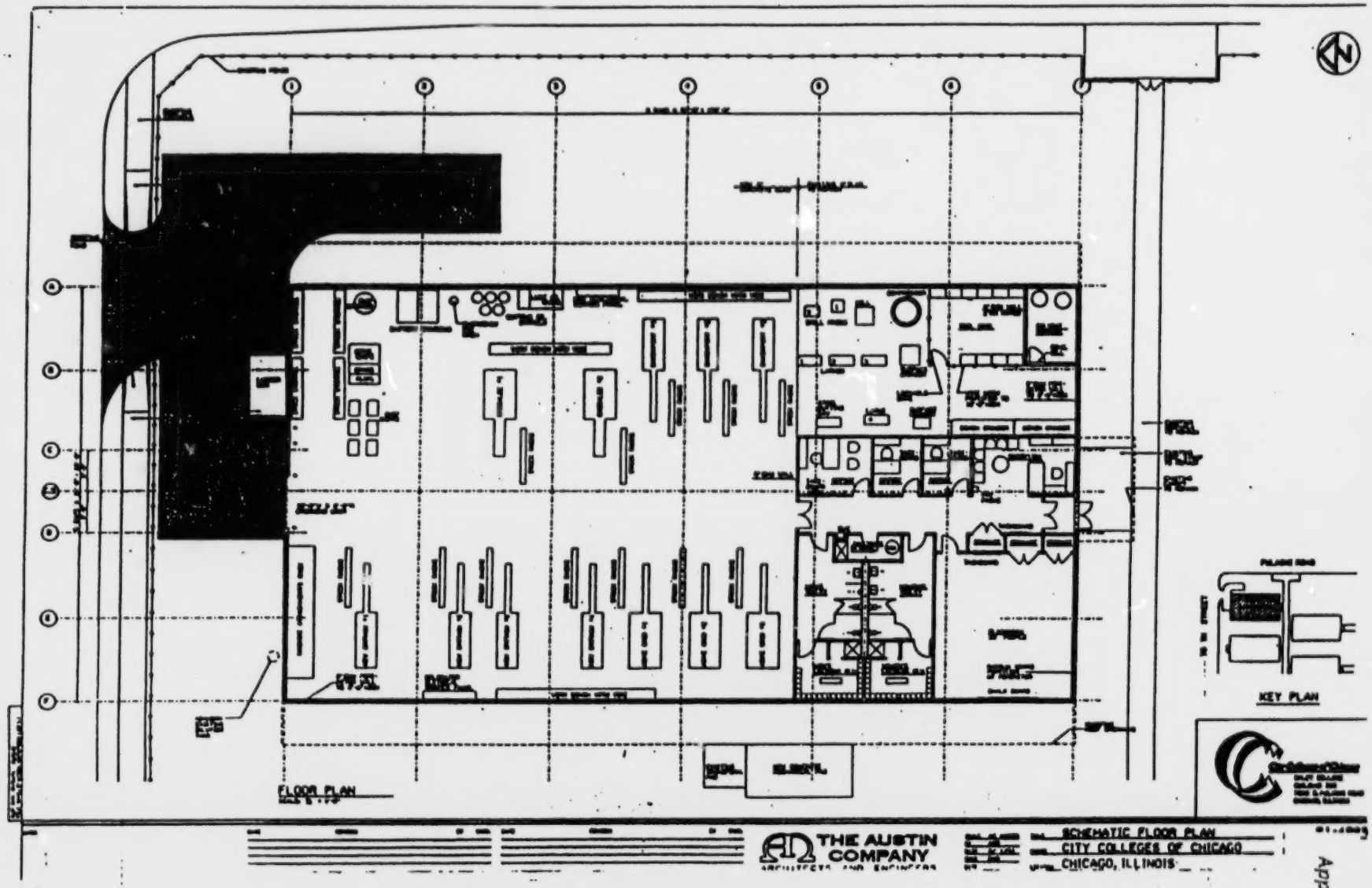

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Prem S. Sud
Director of Manufacturing Technology
Richard J. Daley College
One of the City Colleges of Chicago

CURRENT RESPONSIBILITIES

Mr. Sud is responsible for developing and directing manufacturing technology programs for the City Colleges. This is a relatively new initiative started approximately four years ago. Since then there has been considerable activity on a variety of manufacturing related activities. The first class of students for the Associate Degree in Manufacturing Technology started in January 1992 with 39 students. Certificate (1-year) programs have also been developed and are also being offered for multi-axial screw machines and gear manufacturing. Under development are certificate programs in CAD as well as skills courses on gear manufacturing and CAD. Manufacturing Technology is a primary City College focus which is being supported by the College, foundations, and industry.

As Director for Manufacturing Technology, his responsibilities also include interacting with Chicago industry. The manufacturing industry is a critical segment of Chicagoland employment that has not always been emphasized. As a lead member of Chicago Manufacturing Technology Consortium (CMTC) he has participated in assessments of metalworking firms. Following up with these firms he has helped to get training grants and provide courses on English as a Second Language, Basic Skills, Quality Control, Management Training, and Statistical Process Control. Prem Sud also serves as the primary contact with Illinois Institute of Technology to assure that matriculation from CCC to IIT is possible.

EDUCATION

MS in Industrial Engineering from North Carolina State University
BS in Engineering from PUNJAB University

PROFESSIONAL EDUCATIONAL EXPERIENCE

Manufacturing Resource Engineer
Rock Valley College, Rockford, Illinois

Responsible for the transfer of education, training and advanced technology to local industry to strengthen the industrial base in the Rockford area. Responsibilities included:

* Development of Manufacturing Modernization Program to improve competitive position of local companies.

* Interface with company CEO's and management to carry out assessments of their overall business to determine opportunities or productivity improvement.

* Develop operations and business modernization plant providing resources such as training to assist in implementing improvement strategies.

INDUSTRIAL EXPERIENCE

Before joining academic institutions, Prem Sud has 30 years of industrial experience. This experience provide the credibility needed to deal with owners and managers of small and medium size companies. His most recent industrial position was as Manager of Engineering and Quality Control for Superior Toys in Rockford, Illinois. He was responsible for all facets of engineering services including control of a 370,000 sq ft manufacturing plan as well as set-up of all quality control procedures.

From 1977 to 1989 he was manager of industrial engineering for CARON International of Rochelle, Illinois. He was responsible for three locations operating with a staff of seven engineers. Activities included strategic planning, manufacturing automation, productivity improvement, work simplification, value analysis, JIT concepts, set-up reduction, as well as execution of design and operational improvement programs.

From 1966 to 1977 he worked for Beaunit Corporation in Raleigh, North Carolina. For the last four years he was Corporate Principal Engineer responsible for the planning and execution of manufacturing, automation, material and cost reduction tasks for a six plan corporation. Beaunit Corporation had annual sales of $300M with 7,500 employees.

Prem Sud's first position when coming to the USA was as an engineer between 1964-1966 was for the DuPont Company in Old Hickory, Tennessee. After graduating as an engineer in India he worked for three years (1960-1963) as a manufacturing engineer and production supervisor for Birla Corporation in New Delhi, India.

PERSONAL DATA

Married with two children
U.S. Citizen
Good health

PROFESSIONAL ACTIVITIES

Institute of Industrial Engineers-member
Rochelle, IL Utility Advisory Board
Rotary Club-Past President

Richard J. Daley College

7500 South Pulaski Road
Chicago, Illinois 60652
(312) 735-3000

MEMO TO: President Conway

FROM: Shirley A. Knazze
Dean of Career Programs

SUBJECT: Faculty In-Service Team

DATE: August 12, 1991

The faculty inservice program has been going extremely well. As you can see from the attached listing, there is representation from all of the academic areas. The following recaps activities of last week and plans for next week.

Our program thus far has included:

a) Orientation sessions describing the roles of the Economic Development Commission, and Chicago Commons in the development of a Manufacturing Technology Program at Daley College.

Sharon Wheeler provided a session on the structure and mission of Productive Chicago. She gave a full description of the relationship with the Economic Development Commission as well as the member companies that are represented on their board. She provided information on the linkages developed with the Manufacturing sector over the past year and the accomplishment made in setting up the I-team structure. She discussed how all of the noted groups will come together to fulfill the guidelines set by the Illinois State Board.

I provided a session on Vocational Education which included priorities, how vocational programs such as Manufacturing are developed, who the approval agencies are and what they expect, budget appropriations, etc. Further explained how we will incorporate the Tech Prep concept in program development.

Our third presentation included the new Tech Prep regulations--the expectations of the Illinois State Board of Education. Key components--specifically the importance of academic integration--and how this group could assist this endeavor.

There were many, many questions from faculty. Discussion was excellent.

a) Resource materials have been provided, such as the AVA Guide to the Carl Perkins Act, Metalworking Target Industry Council Report, The IIT Center Report, Draft Copy of Performance Standards, Ex. Summary Report from the National Center on Education and the Economy, the German Project Tour Report (Partners for Productivity). Other smaller reports have been reproduced for them such as the Vocational Education Weekly, the recent Illinois Economic Report, and the special issue of Fortune 1991, "The New American Century." We have also provided recent newspaper articles.

We allowed several days for review and discussion of the materials noted above so that faculty would be better prepared for interaction with the guest speakers invited and our visits with Industry.

c) Outside guests - session leaders.

- Mr. Harry Tobin, Director of Industrial Programs, Chicago Board of Education provided a one-hour and a half presentation on Tech Prep--from the Chicago Board's perspective. It was an excellent presentation. The question and answer session was most informative. Harry further talked about the reorganization at the Board to bring the Department in line with Carl Perkins initiates.

- Mr. Keith McKee, who is heading up the federal sponsored IIT Center provided a presentation on the Proposed Center, its mission, and how it can serve our proposed program in Manufacturing. We all learned alot about Gear Manufacturing. Again the presentation was excellent, the discussions lively, and the questions and answer session was invigorating.

<u>Week 2</u>

a) Our manufacturing facility tours begin on Monday morning at 9:00 a.m. The team will meet at Bodine Electric Company.

Dwayne Pesci, the manager, just called me this afternoon to let me know that Bodine has prepared a 20 minute presentation for faculty before the tour. We expect to spend the morning with Bodine and then off to Camcraft, Inc. for the afternoon.

As you know, the faculty were invited to assist in setting the agenda. Therefore, it has been decided that the faculty will have some sessions on their own to review what they have learned and to thoroughly discuss it. So, Tuesday and Thursday of Next Week, the team will meet on their own. (After each tour day, they felt they needed a day to get ideas on paper.) They have set their own rules of order; i.e., no member will be allowed to hold the floor more than 15 minutes. The meetings will be held in Room 2101. They will provide me with a draft copy of their discussion and their draft suggestions for integrating academics in the development of the Manufacturing Program. We hope to develop some models by the end of the month.

On Wednesday, we will visit Scully Jones Company on the southside of Chicago.

Incidentally, Neil Burke and Ric Guddell of Chicago Commons, have assisted with setting up the tours and will be joining us. Also, I talked with Jack Sheehan, who is heading up the I-team for Manufacturing and he also will join us on the tours. Jack will be our guest speaker and session leader later this month.

Also, talked with Mary Waters. Sometime ago, I mentioned to you that Mary was hired by the State to assist in program articulation between CCC and CPS. She is anxious to meet the faculty team and is also planning a presentation. I hope to have her scheduled for the third week in August.

I have also been in communication with Triton Industry. Their Director of Human Resources, Jane Bryan, would like to come and make a presentation as well as arrange a tour. We hope to fit this in the third week. All in all, the sessions are going extremely well--communication is open and ideas are flowing.

Talked to Prem Sud, our new Director for Manufacturing. He begins Monday. I asked him to meet me at Bodine at 9:00 a.m. so he would not miss out on the tours.

A second weekly status report will be given to you next Monday.

SAK:ag

cc: Sharon Wheeler

THE FACULTY ACADEMIC/TECHNICAL INSERVICE TEAM, MANUFACTURING TECHNOLOGY

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Shirley A. Knazze
Dean of Career Programs
8506 South Rhodes
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(312) 483-7065

Curriculum Fact Sheet

Manufacturing Technology: Multiple Spindle Machining - 62 Credit Hours

This program was initiated in response to a Labor Market Analysis completed in 1990 by the Economic Development Commission of the City of Chicago and the subsequent strategic plan proposed by the Metalworking Industry Council.

The program design represents the collaborative efforts of Productive Chicago, the Economic Development Commission of the City of Chicago, the faculty and staff of Daley College, Chicago Commons, and the Business Sector Organizing Committee, a group of owners/managers and encumbent workers of manufacturing firms in the Cook County area. The design further represents input from the Chicago Board of Education, the Illinois Institute of Technology's Productivity Center, and Department of Adult Technical Education of the Illinois State Board of Education. Two grants for FY91 and 92 have been awarded by the Illinois State Board of Education to assist the college in this effort.

The program has been proposed as an Associate in Applied Science Degree Tech Prep Two-Plus-Two Model. Our objectives, therefore, were:

a) to develop curricula integrating academic and technical competencies;

b) to organize employers and educators as a working group to determine skills necessary to establish core and industry-specific performance standards;

c) to establish articulation agreements with the Chicago Public Schools.

The following program design of academic and technical courses have been driven by the above objectives.

Academic Component (9 courses representing 29 credit hours)

An academic interdisciplinary faculty team participated during the month of August in vocational/tech prep seminars and manufacturing industry tours. The team's purpose was to develop and articulate a manufacturing academic portion for the college and the Chicago Public Schools based on skills and standards identified by the Industry. The courses selected were:

			Credit Hours
	035-0101	English 101	3
	045-0107	Math 107	5
	088-0101	Social Science I	3
	041-0216	Philosophy 216	3
	034-0131	Engineering 131	3
	095-0101	Speech	3
	049-0101	Mechanical Technology 101	3
	030-0111	Business 111	3
*	049-0170	Mechanical Technology 170	3

Technology Component (7 courses representing 30 credit hours)

A subcommittee of the Business Sector Organizing Committee and Chicago Commons prepared a curriculum program manual for training Multiple Spindle set-up/operators. The 35 units prepared by the committee have been incorporated in the following courses:

			Credit Hours
	048-0111	Manufacturing Technology 101	3
	048-0112	Manufacruring Technology 112	2
	048-0113	Manufacturing Technology 113	6
	048-0114	Manufacturing Technology 114	7
	048-0201	Manufacturing Technology 201	3
	048-0215	Manufacturing Technology 215	6
*	048-0216	Manufacturing Technology 216	3

Additional Technology Courses (2 courses representing 6 credit hours)

Two additional manufacturing courses have been developed by the Director in consultation with Rock Valley Community College, Kishwaukee Community College, Peter Trammel, SPC Consultant, and Matthew Kline of Kline and Company.

		Credit Hours
048-0103	Manufacturing Technology 103	3
048-0104	Manufacturing Technology 104	3

Total Credit Hours 62 credit hours

During the past week, several Chicago Public High Schools submitted proposals for funding from their central administration to support articulation efforts with the above program. Two (2) schools were successful: Lane Technical School and Tilden.

* Denotes Options

BEST COPY AVAILABLE

ENROLLMENT DATA
MANUFACTURING TECHNOLOGY PROGRAM

115 Inquiries on Manufacturing Technology Program
1

30 Registered in academic courses

5 Registered in ALSP

3 Referred to Truman

30 Summer Enrollment Projections

DEMOGRAPHICS

Demographics are available for the registered students only:

Blacks:	**10**
Whites:	**12**
Hispanics:	**8**
Males:	**28**
Females:	**2**
Employed Full-Time:	**14**
Employed Part-Time:	**2**
Unemployed:	**14**

Richard J. Daley College
7500 South Pulaski Road
Chicago, Illinois 60652
(312) 735-3000

Office of the President

June 19, 1992

Mr. Warner Birts, Principal
Englewood High School
6201 South Stewart
Chicago, Illinois 60621

Dear Mr. Birts:

This letter will serve as our commitment to articulate with Englewood High School in developing a Tech Prep program in Manufacturing Technology.

We are most pleased to join with you in this endeavor. We began working with the Manufacturing Industry two years ago and have recently implemented a new program. During the past two years, an Academic/Technical Faculty Team as well as an Industry Advisory Committee have been formed. Both groups will be available to meet with you and your staff as the need arises. It is my firm conviction that with all of us working together, we can make a very positive contribution to this industry.

We certainly look forward to a challenging, stimulating and long relationship with Englewood High School in the development and implementation of this most highly needed project.

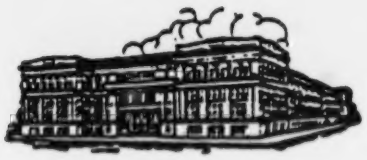
Sincerely,

William P. Conway

William P. Conway
College President

WPC:vms

xc: Dean Knazze
Prem Sud
Fred Majors



Edward Tilden

HIGH SCHOOL

4747 South Union Avenue Chicago, Illinois 60609

January 23, 1992

Prem S. Sud
DALEN COLLEGE
7500 South Pulaski Road
Chicago, IL 60652

Dear Committee Member,

The Tech/Prep Employability Implementation Planning Committee will conduct its next meeting on January 31, 1992 in Room 102 at 10:30 a.m.

Thank you for being dedicated and making a difference.

Sincerely,

Hazel B. Steward

Dr. Hazel B. Steward
Principal

Carolyn J. Smith

Carolyn J. Smith
Facilitator

HBS:CJS/eaw

TECH-PREP/RESTRUCTURING COMMITTEE MEETING

FEBRUARY 25, 1992

LIBRARY

AGENDA

1. Tech-Prep Film

2. Peer Coaching - How it Fits - Oatman

3. Plan on Restructuring

4. Tech-Prep Update

5. INTERNSHIP
   a) Daley
   b) Project Switch

6. Teachers in Program

7. Child Care

8. Staff Development Update
   Open Discussion

9. NEXT MEETING - MAY 20, 1992

Prem
FYI and
we need to make
sure we have our
people ready on
noted dates.
Jack

ARTICULATION-PLANNING STEERING COMMITTEE

Meeting of Tech Prep Team at Daley College
5 December 1991

The meeting started at 9:30 a.m.

Those in attendance were:

Mr. Leroy Kohutynski
Dr. Lorraine Granieri
Mr. James Ewen
Mr. Prem Sud
Dr. Shirley Knazze

Mr. Sud started the meeting by explaining the three programs under consideration at Daley. They are:

A. **The multiple spindle program.**
This associate-degree program will be ready to go by the Spring of 1992.

B. **The gear cutting program.**
This program is under development. It will be an articulated program with I.I.T. with the possibility of beginning in the Fall semester of '92.

C. **The C.N.C. program.**
This program is two years away although some equipment has already been purchased.

Dr. Knazze indicated that students entering the multiple spindle program would place at the 11.0 grade level in math and comprehension. She reviewed the merits of articulating with Lane Tech and recommended the meeting of representatives of the following departments of Daley and Lane:

Math
English
Drafting
Manufacturing

In a discussion of the logistics of articulation, Mr. Kohutynski asked about the possibility that some of the training be done at Lane Tech. Mr. Ewen added that Lane had the equipment already and the trained personnel also. All were in agreement that this was feasible.

Mr. Kohutynski then went on to say that the issue of assigning advanced-placement credit to Lane Tech graduates who qualify should be explored. All were in agreement.

Dr. Knazze then suggested that this issue should be worked out in articulation planning sessions, and meetings were set up between the two teams of Lane and Daley. The time and dates for the meetings are:

- December 16 at the Board Central Office. This meeting is to discuss summer employment opportunities. Ms. Ellen Filurin will facilitate.

- January 8, at 8:00 a.m. at Lane Tech. This meeting will be between Chicago Commons, faculty members of Daley and the Lane Tech Machine Tool Department.

- Third week in January at Daley for math articulation planning.

- Third week in January at Daley for drafting and engineering articulation planning.

- First week in February at Daley for Articulation Planning Steering Committee.

The meeting adjourned at 12:00.

Lane Technical High School
Tech Prep Planning Meeting

25 March 1992

The meeting began at 1:00

In attendance:

J. Ewen
L. Granieri, Crescent Group
J. Jacquez
S. Knazze, Daley College
L. Kohutynski
J. Kolar
D. Schlicting
B. Sherman
P. Sud, Daley College

Mr. Kohutynski introduced the session by reviewing the background of previous meetings on articulation with representatives of Daley College. Those meetings dealt with describing the scope and sequence of the curricula at both schools as a means for determining the appropriateness of the "match" between Lane's machine tool curriculum and Daley's Manufacturing Technology (MT) program. The issues to be addressed may be summarized as follow:

1. Since most Lane graduates who go on to college do so at four-year institutions, could these students be induced to attend the City Colleges to earn a certificate or an associate degree?
2. Is Daley's MT program, with its emphasis on multiple-spindle machining, an appropriate vehicle to develop the continuity of instruction with Lane's program, or is it a discontinuous program not suited to Lane students' academic and vocational preparation?

The ensuing discussion focused on clarifying two additional issues:

- Transferability of credits earned at Daley to four-year institutions
- Advanced placement of Lane graduates in Daley's collegiate programs

Dean Knazze responded to the first issue by indicating that while issues of transferability were a discretionary matter for postsecondary institutions, general education credits are often accepted in transfer to four-year colleges. Mr. Sud noted that an articulation meeting on this matter has been scheduled between Daley and Northern Illinois University (NIU).

In the matter of advanced placement, Dr. Granieri cited the Comprehensive Articulation Agreement reached in 1987 between The City Colleges of Chicago and The Chicago Public Schools and indicated that it might serve as a basis for determining placement levels. The Agreement specifies a process for collaborative planning to share resources, eliminate duplicated effort, and develop specific subject area articulation agreements. Dean Knazze responded that the Agreement was essentially a decision "to agree" on these issues. As far

as meeting participants were aware, no action on the stipulations in the Agreement has been taken.

Voicing a concern about programming requirements, Mr. Schlicting raised the matter of scheduling priority for Lane's proposed Articulated Tech Prep (ATP) program and questioned whether the procedures in place would accommodate pilot programs enrolling fewer than the number of students required to fill a section. Mr. Ewen reported that potential enrollments for ATP may be 5-10 students.

Dr. Knazze reiterated the purpose of the Manufacturing Technology program stating that its primary intent is to qualify graduates for employment in industry by awarding the MT certificate or associate degree; in this regard, it is not intended as a substitute for a four-year degree program. Mr. Kolar suggested that there is probably a population of Lane students who would find this option attractive.

With regard to the issue of continuity of instruction between secondary and postsecondary levels, Mr. Kolar introduced a variety of curricular materials that have already been prepared in conjunction with NIU as valuable resources in program articulation planning. Mr. Jacquez, who participated in developing these materials, acknowledged their current usefulness.

By the end of the meeting, it was concluded that, based on the information communicated by Dean Knazze, the Lane Tech Prep Team had the information it needed to settle the issue of the appropriateness of articulation with Daley's program.

The meeting concluded at 2:15.

June 22, 1992

Dr. Hazel Steward
Tilden High School
4747 South Union
Chicago, IL 60609

Dear Dr. Steward:

This letter is based in part upon our sincere appreciation for the cooperation and enthusiasm of you and your staff during the past year, and in addition on our eagerness to continue and expand our articulation efforts over the coming academic year. The series of meetings with you and your staff certainly left us highly motivated. I feel that the planning phase was successful and that the concepts that both you and I hold toward training needs in Manufacturing Technology have been clearly articulated to our academic and technical faculty.

It is noteworthy that our articulation efforts have come precisely at the time when manufacturing production companies need our assistance the most. It is, therefore, an unmistakable opportunity for us to collaborate with them on the necessary needed training and educational needs. We just completed a two-week program of faculty tours to various manufacturing plants. The need for an educated workforce is of primary concern if companies are to remain in the global competitive arena. Most of the companies clearly express their desire to become stronger, more competitive industries. All welcomed our interest.

During the summer, as you know, we will begin working with those graduates from Tilden that were recommended to us. Letters have been sent to them and we expect to start our assessments this Friday. We will forward all scores to you and hopefully they will provide us with a starting point for our academic articulation next Fall. Students will also work in a manufacturing production environment. Employer feedback will also be shared with you so that work ethic needs can be jointly identified. Please thank Paul Wolniak for his tremendous assistance in identifying the graduates interested in Manufacturing Technology.

Hopefully, the above assessment data when developed will provide the background for us to develop over the next year a matriculation strategy that will be consistent from one year to another; possibly assist in the development of a series of joint-evaluation questions; as well as the development of a framework for internal and external reporting purposes.

Meanwhile, if you are in need of any materials or assistance from us prior to the start of the Fall semester, just call. Otherwise, we will be contacting you in late August to establish some meeting dates.

Again, we appreciated your hospitality and effective meetings and look forward to a long, productive relationship with you and your staff at Tilden.

Sincerely,

Shirley A. Knazze, Ph.D.
Dean of Career Programs

cc: President Conway

Board of Trustees of
Community College District No. 508

.16223

BOARD OF TRUSTEES OF COMMUNITY COLLEGE DISTRICT NO. 508
County of Cook and State of Illinois

JAN 23 1992

COUNTY OF COOK
AND STATE OF ILLINOIS

PROFESSIONAL SERVICES AGREEMENT
MANUFACTURING TECHNOLOGY PROGRAM
DALEY COLLEGE

TO THE BOARD OF TRUSTEES:

THE CHANCELLOR

REPORTS that a manufacturing technology program-multiple spindle screw machine program at Daley College is being developed in partnership with Chicago Commons Association and the Screw Machine Industry Training and Standards Board under the sponsorship of the Economic Development Commission of the City of Chicago, its Metalworking Industry Council, and the Productive Chicago Career Preparation Initiative of the City Colleges of Chicago; and

that students are expected to enroll in core academic courses for this program in January 1992 in preparation for technical courses in multiple screw machining during the following semester, and Building 300 at Daley College is being renovated in preparation for receipt on or about February 1, 1992 of equipment and peripherals for the laboratory purchased by CCC and equipment donated by the industry to Chicago Commons Association for this program, said donated equipment having been transported and temporarily stored courtesy of Helene Curtis, Inc.; and

that CCC and Chicago Commons Association have developed an agreement specifying their respective roles in program start-up; use of equipment and facility for the program, and services to be provided by each party from January through June 1992 including technical assistance services from Chicago Commons Association for the purpose of continued industry direction, equipment refurbising and set-up, development of competency based lesson plans and materials, and student screening.

THE CHANCELLOR

RECOMMENDS that the Board of Trustees approve the agreement with Chicago Commons Association and authorize the Chairman and Secretary to execute said agreement on behalf of the Board; and approve issuance of a $124,192 purchase order to Chicago Commons Association for it services to the manufacturing technology program at Daley College during the period January through June 1992.

FINANCIAL Charge to: 6-15-255-51-35

Respectfully submitted,

Approved:

Nelvia M. Brady
Chancellor

Laurence B. Stanton
Vice Chancellor

Robert C. Rogers
Executive Vice Chancellor

Approved as to Legal Form:
General Counsel

January 23, 1992

Richard J. Daley College

7500 South Pulaski Road
Chicago, Illinois 60652
(312) 735-3000

MEMORANDUM

TO: William P. Conway
President

FROM: Dr. Shirley A. Knazze
Dean of Career Programs

DATE: June 05, 1992

RE: Articulation with IIT

As you know, Prem Sud has been working closely with Keith McKee on the assessments of Manufacturing companies, customized training, and articulation. You will see from the attached that Prem's efforts are helping to bring about a much needed change for vocational education.

In reading Keith's Executive Summary which is so beautifully stated-, I could not help but feel that this is what we have been striving for so hard and so long.

Prem needs your written approval immediately so that he will be listed in Keith's proposal as Co-investigator. (See 3rd paragraph of Keith's letter to Prem.)

Enclosure

SAK:tc

The Manufacturing Productivity Center
IIT CENTER / 10 WEST 35 STREET / CHICAGO, ILLINOIS 60616 / 312/567-4800

DR. KEITH E. McKEE, MPC DIRECTOR
MRS. SHIRLEY J. McCUMBER, SECRETARY TO THE DIRECTOR
MRS. CAROL J. SESSIONS-ROBINSON, MPC EDITOR

June 4, 1992

Dr. Prem Sud
Director of Manufacturing Technology
Daley College
7500 S. Pulaski Road
Chicago, IL 60652

Dear Prem:

As you know, IIT is preparing an NSF proposal to "Develop a Bachelor of Manufacturing Degree for Those with Associate Degrees in Related Subjects that can be Completed in Two Years." A copy of the Executive Summary is attached.

If there is to be a third 2 in 2+2+2, I'm persuaded a new bachelor program has to be developed and this is what we're proposing.

I would like to list you as a co-investigator for this effort indicating that this will be done as part of your ongoing work on Manufacturing Technology at Daley College, i.e., without giving CCC any money. We are building $126,000 into the program for course development and we plan to use CCC staff for about half of this. I'm budgeting $6000 per course and for most of them I'd like to get a technical specialist together with an educator.

At any rate, for now I'd like your involvement. I've asked Ellen Filurin to get a letter of support from the Chancellor's office.

Regards,

Keith

Keith E. McKee
Director

Attachment

DEVELOP A BACHELOR OF MANUFACTURING TECHNOLOGY DEGREE FOR THOSE WITH ASSOCIATE DEGREES IN RELATED SUBJECTS THAT CAN BE COMPLETED IN TWO YEARS

EXECUTIVE SUMMARY

Illinois Institute of Technology proposes to develop and offer a Bachelor of Manufacturing Technology (BMT) degree program for graduates of Community Colleges who have completed Associate degrees in vocational subjects or have an equivalent vocational education. This pilot program provides an articulated Bachelor program for vocational students. This is a unique approach that is not currently available. If successful, it can serve as a model for other major industrial cities.

There is bifurcation in education between vocational education and college education. Early during their secondary education, students are classified as those bound for college and those that will go into vocational education. Vocational education here is a euphemism for second-class education. This is unfortunate in at least two respects: first, not all vocational students are "education dropouts" - some are bright students who simply are not interested in the academic approach - and others are people whose manual skills and interests overwhelm other interests and talents. Unfortunately many of the students placed (or forced) into vocational education are really "educational dropouts" - students who by talent or choice are not interested in learning anything.

Vocational education is far too important to be treated as the dumping ground for students who are not deemed worthy of a "real education". Many people in this country are interested in the European model for apprenticeships where the candidates have qualifications equal to or perhaps superior to students seeking a purely academic education. The USA is not organized to use this approach and is not likely to change to the European system for decades if ever. The educational system in the USA is based on a different approach and this is not likely to rapidly change.

The challenge for the USA is to live with and build upon the system that presently exists. As a nation we can and must strive to improve the education of all students. We should also strive to upgrade the educational level of students who select vocational education. At least in the near term, it is unrealistic to assume that the average student going into vocational education will be as talented as those going into more academically related curricula. However, some of the students selecting vocational education are extremely talented, and it is proposed here to provide an educational outlet so that these individuals can build upon their vocational background. Increased emphasis on vocational education may upgrade the average student entering those programs, but it is not likely, at least in the near term, to significantly change the student population taking vocational programs. The hypothesis for this proposal is that the USA must take actions to select the best candidates from the existing vocational education system and provide them with an opportunity for further education.

Accepting vocational education as an end in itself is not adequate and deprives the nation of talents that are badly needed. As currently sturctured, vocational education is unfair to students since it provides only "dead-end" degrees.

It is proposed to develop and offer a Bachelor of Manufacturing Technology (BMT) degree that accepts the best of the vocationally trained students and gives them credit for their vocational training. These candidates would, after taking the third and fourth years, receive baccalaureates. This combination of vocational and academic training will produce graduates fully prepared to work in manufacturing operations as supervisors, staff, managers, and business owners. The graduate will have an education better suited for small and medium sized manufacturing companies than college graduates with either engineering or liberal arts degrees.

The BMT would be based on two years of academic education building upon the students already demonstrated vocational skills. Courses would cover technical, operational, managerial, and financial areas. The presentations of these subjects would be organized to increase the communication, research, and reasoning skills of the students. Computers would be used throughout the program, but no laboratory courses would be required since the students would bring adequate practical knowledge into the program.

Anita
Put in Mont.
Binder

XC: admin—Appendix M
Zinder
Mayer

500 REISCH BUILDING
4 WEST OLD CAPITOL SQUARE
SPRINGFIELD, ILLINOIS 62701
(217) 782-2551

92 6 18 38

ARTHUR F. QUERN
CHAIRMAN

RICHARD D. WAGNER
EXECUTIVE DIRECTOR

BOARD OF HIGHER EDUCATION
STATE OF ILLINOIS

March 4, 1992

Dr. Nelvia M. Brady
Chancellor
City Colleges of Chicago
225 West Jackson
Chicago, Illinois 60606-6997

Dear Dr. Brady:

The Illinois Board of Higher Education, at its March 3, 1992 meeting, authorized Richard J. Daley College to offer the following programs.

- Associate in Applied Science in Manufacturing Technology: Multiple Spindle Machining
- 38 Semester Credit Hour Certificate in Manufacturing Technology: Multiple Spindle Machining
- 26 Semester Credit Hour Certificate in Manufacturing Technology: Multiple Spindle Machining

In addition, the Board authorized Malcolum X College to offer the following programs which will be discontinued at Chicago City-Wide College.

- Associate in Applied Science in Emergency Medical Technology-Paramedic
- 31 Semester Credit Hour Certificate in Emergency Medical Technology-Paramedic
- Associate in Applied Science in Mortuary Science/Pathology Assistant
- Associate in Applied Science in Physician Assistant
- Associate in Applied Science in Radiation Therapy Technology
- 31 Semester Credit Hour Certificate in Advanced Standing Radiation Therapy

Let me wish you every success with these programs which will serve the residents of Community College District 508.

Sincerely,

Richard D. Wagner
Executive Director

cc: Mr. Cary A. Israel
Mr. William P. Conway
Ms. Zerrie Campbell
Dr. John Wozniak

Printed on Recycled Paper

XC: administrative staff

24 JAN 92 9:56

HARRY L. CRISP II
Chairman

CARY A. ISRAEL
Executive Director

ILLINOIS COMMUNITY COLLEGE BOARD

509 South Sixth Street, Room 400
Springfield, Illinois 62701-1874
(217) 785-0123

January 17, 1992

Dr. Richard D. Wagner
Executive Director
Illinois Board of Higher Education
500 Reisch Building
4 West Old State Capitol Plaza
Springfield, IL 62701

Dear Dick:

At its January 17, 1992 meeting, the Illinois Community College Board approved new units of instruction for the following colleges:

City Colleges of Chicago - Richard J. Daley College

Associate in Applied Science Degree in Manufacturing Technology: Multiple Spindle Machining (62 semester credit hours)
38 Semester Credit Hour Certificate in Manufacturing Technology: Multiple Spindle Machining
26 Semester Credit Hour Certificate in Manufacturing Technology: Multiple Spindle Machining

City Colleges of Chicago - Malcolm X College

The following programs are being transferred from Chicago City-Wide College to Malcolm X College:

Associate in Applied Science Degree in EMT-Paramedic (61 semester credit hours)
31 Semester Credit Hour Certificate in EMT-Paramedic
Associate in Applied Science Degree in Mortuary Science/Pathology Assistant (65 semester credit hours) (statewide program)

City Colleges of Chicago - Malcolm X College (continued)

Associate in Applied Science Degree in Physician Assistant Program (77 semester credit hours) (statewide program)
Associate in Applied Science Degree in Radiation Therapy Technology (69 semester credit hours) (statewide program)
31 Semester Credit Hour Certificate in Advanced Standing Radiation Therapy (statewide program)

Elgin Community College

Associate in Applied Science Degree in Medical Laboratory Technology (66 semester credit hours)

Kaskaskia College

Associate in Applied Science Degree in Industrial Technology (67 semester credit hours)
31 Semester Credit Hour Certificate in Industrial Technology (for offering at the Centralia Correctional Center)

Parkland College

26 Semester Credit Hour Certificate in Radiation Therapy (statewide program)

Prairie State College

30 Semester Credit Hour Certificate in Hospitality Services
22 Semester Credit Hour Certificate in Office Desktop Publishing

Richland Community College

Associate in Applied Science Degree in Computer Integrated Manufacturing (64 semester credit hours)

South Suburban College

Associate in Applied Science Degree in Computer-Aided Manufacturing/Manufacturing Engineering Technology (67 semester credit hours)
Associate in Applied Science Degree in Corporate Records Management (64 semester credit hours)

The ICCB requests Illinois Board of Higher Education approval of these new units of instruction. A copy of each request and a copy of the agenda item have been forwarded to your staff for review.

Sincerely,

Cary A. Israel
Executive Director

CAI:DW:lmi/1167i

cc: Tim Rock, IBHE
John Klit, ISBE
Neliva M. Brady, Chicago
William P. Conway, Daley
Zerrie D. Campbell, Malcolm X
Paul R. Heath, Elgin
Raymond D. Woods, Kaskaskia
Zelema M. Harris, Parkland
E. Timothy Lightfield, Prairie State
Charles R. Novak, Richland
Richard W. Fonte, South Suburban

Appendix N

23 MAR 92 3:57

CHICAGO PUBLIC SCHOOLS

Ted D. Kimbrough
General Superintendent of Schools

Department of Vocational and Technical Education
1819 West Pershing Road • Chicago, Illinois 60609 • Telephone 1-312/535-8851

Bernard R. Spillman
Assistant Superintendent

March 19, 1992

Mr. William Conway
President
Richard J. Daley Community College
7500 South Pulaski
Chicago, Illinois

Dear Mr. Conway:

As a follow-up to our meeting with Chancellor Brady and Chairman Gidwitz, Mr. Norbert Stengel, Chairman of the Chicago Public Schools Machine Trade Advisory Council, and I wish to meet with you and Chancellor Brady's staff, to further develop the Tech-Prep partnership between our two Machine/Metals programs.

This letter is to confirm that the meeting will convene at 8:30 a.m. on March 27, 1992 in the President's Conference Room at Daley Community College.

Sincerely,

Bernard R. Spillman

cc: Dr. Nelvia Brady
Mr. Ronald Gidwitz
Mr. Norbert Stengel

BRS/fc

City Colleges of Chicago

Productive Chicago
(312) 855-8082

MEMORANDUM

To: William P. Conway, President
Daley College

From: Sandra Filion Foster, Associate Vice Chancellor

Re: Machine Trades Advisory Council Meeting

Date: February 27, 1992

The Chicago Public Schools Machine Trades Advisory Council has requested a meeting to discuss a partnership role in Productive Chicago. This linkage could help strengthen Tech Prep goals in the Manufacturing Technology Program and related subsectors. Dr. Brady has scheduled a meeting for Tuesday, March 10, 1992 in Conference Room 1421. Bernie Spillman has confirmed, and I would like you, Dean Knazze and Pre Sud to join us. Please let me know if you will be able to attend.

/jp

cc: Nelvia Brady
Milton Hill
Sharon Wheeler
Shirley Knazze
Prem Sud ✓

226 West Jackson Boulevard Chicago, Illinois 60606-6997
(FAX 312/641-1705)

Appendix O

Item
Carl Perkins

ADOPTED
Board of Trustees of
Community College District No. 508

JAN 23 1992

COUNTY OF COOK
AND STATE OF ILLINOIS

16239

BOARD OF TRUSTEES OF COMMUNITY COLLEGE DISTRICT NO. 508
County of Cook and State of Illinois

MANUFACTURING TECHNOLOGY PORTFOLIO PRINTING
CITY COLLEGES OF CHICAGO

TO THE BOARD OF TRUSTEES:

THE CHANCELLOR

REPORTS that there is a need for a Manufacturing Technology Program marketing portfolio that will communicate opportunities and requirements of technical careers to students, parents, educators and potential employers; and, that Ogilvy & Mather Public Relations was authorized by the Board of Trustees to develop the Manufacturing Technology Program marketing portfolio; and,

that written bids were solicited for printing by Ogilvy & Mather Public Relations as part of their obligation in preparation of the marketing portfolio. Specifications were issued to four companies for preparation of 1000 three-color marketing kits including pocket folder, booklet, brochure, quiz, and business flyer; and, bids were obtained as follows:

Great Northern/Design Printing Co.	$15,869
Intel Printing, Inc.	$16,500
The Segerdahl Corporation	$17,126
Columbian Lithographing Company	$15,420

The lowest bid was unacceptable because the time frame specifications could not be met. The second lowest bidder, Great Northern/Design Printing Co. met all specifications requirements.

THE CHANCELLOR

RECOMMENDS that the Board of Trustees approve issuance of a purchase order in the amount of $15,869, from the MacArthur Foundation award to Productive Chicago, to Great Northern Design Printing Co. for complete preparation of the Manufacturing Technology marketing portfolio, in accordance with specifications.

Charge: 5-15-256-43-39 - $13,000
5-15-252-43-39 - $ 2,869

Prepared by:

Laurence B. Stanton
Vice Chancellor

Robert C. Rogers
Executive Vice Chancellor

January 23, 1992

Respectfully submitted,

Nelvia M. Brady
Chancellor

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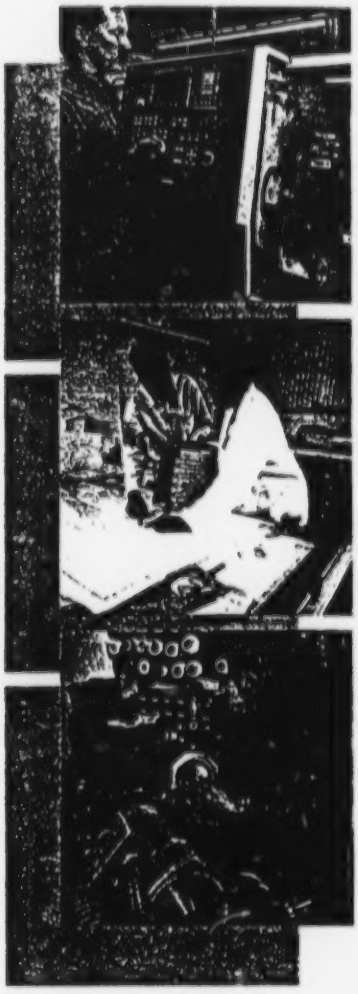
PRODUCTIVE CHICAGO

City Colleges of Chicago



Careers in Manufacturing Technology

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PRODUCTIVE CHICAGO

- *What will I do when I leave high school?*
- *What kind of job do I want?*
- *Do I want to go to college?*
- *Will I make enough money to support myself and my family?*
- *What if I make the wrong choice, will I be trapped in a bad job or career?*
- *How can I get ahead?*

As a young adult, you are faced with these, and other, difficult questions — some of the most important decisions you'll ever make. There are many choices and many possible career paths, and at 16, 18, or 20 years old it's hard to know which is right for you, to know which path to take.

You want a good job — one that pays well and offers the chance to move up and increase your salary. You want an interesting job that's more than just a dead end. You want the education necessary to succeed in the 21st century — but you don't want to wait until 2010 to start enjoying life.

How can you have all these things? How can you be sure you're on the right track? How can you guarantee yourself a future with options, with mobility, with room to grow and change?

If you're good at math, like to create things, have ever wondered how something was made or been fascinated by the intricate construction of your radio or television, Productive Chicago's Manufacturing Technology Program can provide the answers to the tough questions you must face. If you've thought about a career in manufacturing, or want to learn more, Productive Chicago can provide the training and experience necessary to succeed in a profitable career.

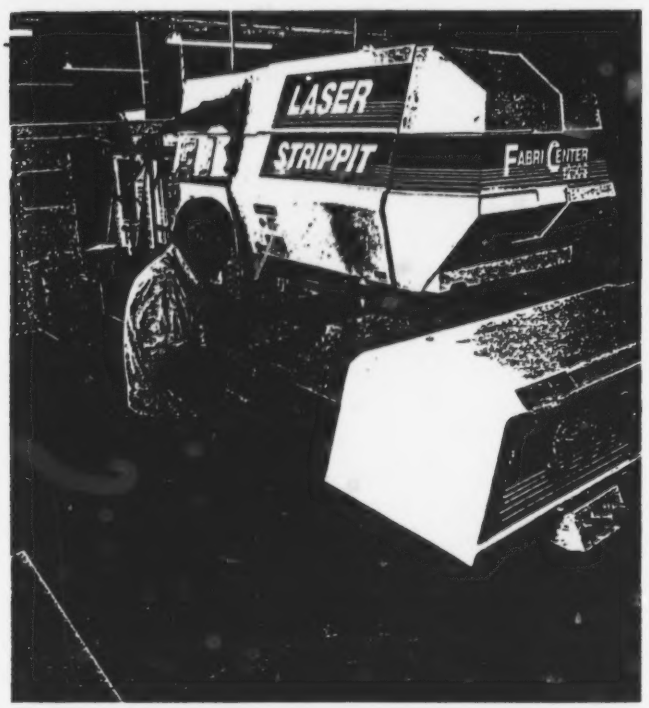
Productive Chicago's Manufacturing Technology Program is a partnership between the Chicago Public Schools, the City Colleges of Chicago, the Chicago Commons Association, the Economic Development Commission of the City of Chicago and the Chicago manufacturing industry. It exists to provide young people with options for their future, and to provide businesses in Chicago with educated, capable young people eager to get ahead.

"After I graduated from Dunbar Vocational High School I juggled from shop to shop to figure out what type of area I wanted to be in. I realized that my heart belonged in a machine shop. I had an instructor in high school who always said if you work hard and stay on track, you'll get where you want to be. When I finished an internship program with another company, I joined Hudson as an apprentice. Three years later, I moved up to operator and set-up man, and now I'm a universal set-up man in training for secondary machining. If you're interested in manufacturing technology you need to be dedicated, responsible, diligent, and be responsible for yourself, your actions and the work you put out."

Rodney Wilson
Universal Set-Up
Hudson Screw Machine Products

It is a combination of classroom and work-based learning that offers students continued opportunity and a variety of career and educational alternatives.

Productive Chicago stretches across high school and college, incorporating courses in the Chicago Public Schools, the City Colleges of Chicago, on-the-job experience and participating four-year institutions.



Machine-shop Foreman	**$37,856**
Modelmaker	**$35,889**
Tool and Die Maker	**$34,041**
Maintenance Machinist	**$31,731**
Screw Machine Set-Up	**$27,489**
Lathe Operator	**$26,103**
Numerical Control Operator	**$22,512**

Average annual salaries for selected Chicago-area Manufacturing Technology positions with up to three years experience.

Chemist	**$33,332**
Computer Programmer	**$30,732**
Accountant	**$27,664**
Administrative Assistant	**$26,104**
Computer Operator	**$19,708**
Secretary	**$19,916**
Clerk	**$17,420**

Average annual salaries for selected Chicago-area non-Manufacturing Technology positions with up to three years experience.

Source: Northern Illinois Industrial Association's 1991 wage and salary survey.

You Can Have a Future in Manufacturing Technology

In the next ten years more than 8,000 *new* metal-workers will be needed in the city of Chicago alone. You could be one of them. The name is misleading, metal-workers are in fact *manufacturing technologists.*

They create the parts essential to the operation of high-tech industries such as aerospace, automobiles, computers, consumer electronics and even clothing manufacturing.

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PRODUCTIVE CHICAGO

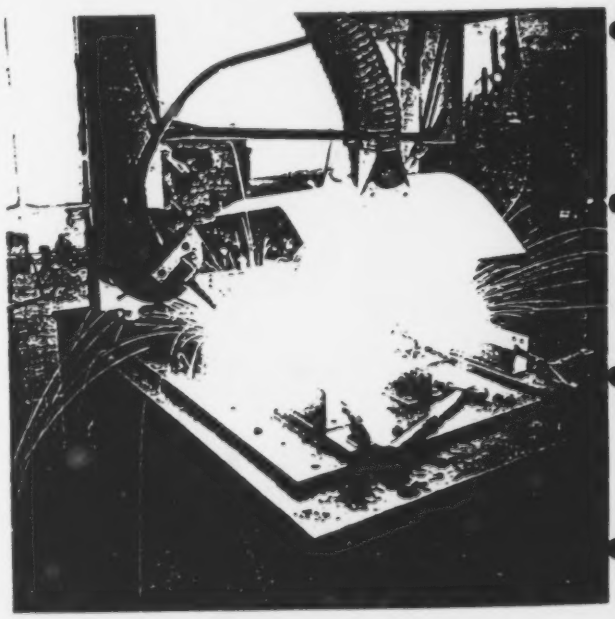
"Metalworker" is a broad description that encompasses a wide variety of jobs, including tool and die makers, machine tool specialists, mold makers, machine tool programmers, machinists and sheet metal workers. Additionally, many engineers, designers, supervisors and metalworking company owners started their careers in Manufacturing Technology as metalworkers. A metalworker can follow any of these career paths.

A career as a metalworker is challenging. Positions in metalworking are well-paying and professionally satisfying, with salaries ranging from approximately $20,000 in the first year to more than $40,000 after only a few years on the job. For you, that can mean your own house or apartment, a car, a stereo, savings, a vacation, clothes — whatever is important to you.

Today's metalworking company provides a modern and stimulating work environment. The computers and intricate machinery used in metalworking manufacturing demand that this industry — and you — remain on the cutting edge of technology. Recent technological advances include computer aided manufacturing (CAM) and computer-aided design (CAD), innovations that can be used in a wide variety of jobs. That translates into mobility and flexibility for anyone who can use them.

"I started here on the drill press in 1966. After six months, I went to work in the quality control inspection area. They told me they would teach me all the skills I needed — and they did. I kept taking classes so I could learn more, and in 1981 I was promoted to quality control manager. Someone interested in this field, should take math and drafting courses in high school and enroll in the Productive Chicago manufacturing technology program. By taking those classes they'll learn more about this field and how things are made."

Maria Briones
Quality Control Manager
Triton Industries



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What Does a Metalworker Do?

Metalworkers use modern, state-of-the-art machinery to cut, shape, bend and form intricate and complex shapes in metals and alloys to dimensions measurable only with precision instruments. Metalworkers make the vital parts of goods ranging from automobiles to stereos to athletic shoes.

Because the jobs are so technical, and metalworkers so highly skilled and so valuable, it is difficult to replace metalworkers, and to fill the metalworking positions that are available. As a result, there are many openings and a wide variety of opportunities. Many metalworkers, even in their early years with a company, are in supervisory positions because of their value.

Because of their skills and the precise tolerances needed to create delicate molds and the minute, but crucial, working parts of machinery, metalworkers are often referred to as "the surgeons of steel."

"This is one of few businesses where workers have control over the things produced, have a sense of accomplishment, and have an understanding of the business of manufacturing in this country. People in this field add value to the economy because they make things that are needed, and will always be needed. There are great financial rewards, but what is most rewarding is seeing a project through to completion — of getting the job done. Young people today are looking for a working environment that is not dirty or dangerous. Our shop is clean, updated, computer-driven and uses robotics and automated machinery."

Bernard Bertsche
Owner
CamCraft

Productive Chicago Manufacturing Technology Makes a Difference For You

The Productive Chicago program is your starting point for a career in Manufacturing Technology. Where that career takes you, and what it includes, is up to you. The hallmark of Productive Chicago is a combination of classroom learning and supervised work-based instruction. This comprehensive approach provides the tools necessary to not only begin a career, but to successfully advance along a rewarding career path.

The Productive Chicago Manufacturing Technology team worked together to develop the Manufacturing Technology curriculum. This means that the people who will hire you — metalworking companies — know that you will come to them fully prepared to perform the job. That gives a Productive Chicago graduate a significant advantage in the job market.

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The metalworking industry has also made a commitment to Productive Chicago and its students by providing equipment, training, supervised work-based learning and jobs. The result is a program that offers students a chance to prepare for a career, receive college credit and earn a salary while they learn. And it provides highly-skilled, highly-productive employees for the Chicago metalworking industry.

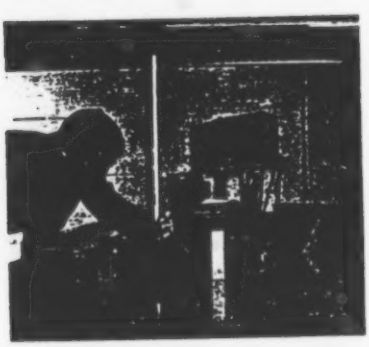
Your Options

With Productive Chicago, your future opportunities are unlimited. You can complete whatever level of education you wish, or go back for more education later after you've been in the workforce for a few years.

Students who wish to continue their metalworking education beyond the two years at the City Colleges of Chicago will find excellent four-year programs in Illinois at institutions such as the Illinois Institute of Technology and Western Illinois University. These programs lead to careers as engineers, advanced tool and die designers, corporate managers, computer technicians and industrial designers.

Productive Chicago's Manufacturing Technology Program is the starting line for the career — and the future — of your choice.

How to Get Involved in Productive Chicago Manufacturing Technology



Not everyone can be a metalworker. The industry is looking for workers who are strong in math, enjoy working with their hands, who have a strong work ethic and like working with others. Metalworkers should also be able to communicate, to solve problems and to think logically.

These skills are taught in Productive Chicago's Manufacturing Technology Program. Productive Chicago guarantees that their students will be problem-solvers and have both the academic and technical skills necessary for continued success.

For the metalworking company that means a more productive workforce and greater profit. For you it means a good job with good prospects for advancement and a variety of career choices.

The Productive Chicago Manufacturing Technology Program teaches students how to master intricate manual and automatic, basic computer numeric control machine tools (lathes, milling machines, grinders, and other tools) used to cut or shape metal. It also provides study in the theory behind this machinery while in the classroom.

Students can enter the program either in their junior year of high school or their first year of college. While in high school, students will focus on applied academics and basic metalworking skills.

During the first year at the City Colleges of Chicago, Manufacturing Technology courses include Introduction to Manufacturing Technology, Manufacturing Economics, Introduction to Quality Control, and Physics/Chemistry/Metallurgy. The second and final year of the City Colleges metalworking program focuses on intense lab instruction and work-based learning at metalworking companies throughout the city.

Although the program is education-based, and leads to an Associate of Applied Science degree in manufacturing technology, the work place is the central feature. Productive Chicago graduates are ready for immediate employment.

"I started in metalworking shoveling chips in the machine room. Later, an older worker taught me the many aspects of the trade and it wasn't too long before I started training new apprentices. As I moved up in my career to line supervisor in multiple spindle screw machine, I began doing more advanced training. Eventually, I ended up on the business side working for the union and now, the City Colleges and other metalworking companies. I've always earned a good salary. I have a home and five vehicles — I'm doing well. This is an interesting and very challenging field. It really teaches you how to think and solve problems."

Nell Burke
Project Coordinator
Productive Chicago Automatic Machine Program

Manufacturing Technology Is For Me

If a career in Manufacturing Technology sounds interesting, consider the program offered through Productive Chicago. For more information or to enroll, call Daley College at (312) 735-3000 Extension 204 or 209, or talk to your counselor.

City Colleges of Chicago

Board of Trustees
Community College District No. 508
County of Cook and State of Illinois

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Chairman

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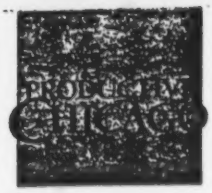
PRODUCTIVE CHICAGO

Productive Chicago's Manufacturing Technology Program is a cooperative venture with support from:

City Colleges of Chicago
Chicago Commons Association
Industrial & Business Training Division
Chicago Department of Economic Development
Chicago Manufacturing Institute
Chicago Public Schools
Daley College
Economic Development Commission of the City of Chicago
Illinois institute of Technology Research Institute
Illinois State Board of Education
The John D. and Catherine T. MacArthur Foundation
Multiple Spindle Business Training Committee



Productive Chicago Can Produce Results for Your Business

You are invited to participate in the Productive Chicago Career Preparation Initiative. Your input is needed to keep our academic and technical educational design in tune with industry standards.

Productive Chicago, in turn, can provide your company with highly-skilled interns and graduates ready for the workforce, to help ensure that you remain competitive into the future.

For our program to remain successful and an integral part of the Chicago business community, we need your commitment to:

■ Provide work sites and job slots

Our students need internship positions in order to learn the metal-working trade. Once they graduate from our program, they will seek employment in the Chicago area—with your help in the education process of this program, these graduates will be ready to step into positions immediately.

■ Define industry standards

We need to keep the Productive Chicago Manufacturing Technology curriculum updated. That's why we need your help in defining performance and evaluation standards.

We've created our program around your recommendations as an industry, now we ask that you help us adapt that curriculum around current needs. If you define the standards, we guarantee to produce a student who meets or exceeds them.

■ Assist in marketing this program to your colleagues and peers

This program can only be successful if we have students enrolled and industry to support us. That may seem elementary, but word-of-mouth is the best form of marketing. If you agree that this metalworking program meets your needs, please spread the word.

City Colleges of Chicago

Richard J. Daley College

7500 South Pulaski Road
Chicago, Illinois 60652
(312) 735-3000

MEMORANDUM

TO: Dr. Shirley A. Knazze
Dean of Career Programs

FROM: Prem S. Sud
Director, Manufacturing Technology

DATE: June 05, 1992

SUBJECT: Faculty Team Visits to Gear Manufacturing equipment facilities.

Per your instructions, I have made arrangements with three different Gear Manufacturing equipment facilities to provide tours of their facilities to our faculty. These organizations will be ready for our visit, and will be glad to provide any assistance our team might need. The schedule for our visits is:

Thursday, June 11, 1992

Chicago Gear/D.O. James Corp
2823 W. Fulton St.
Chicago, IL 60612
Contact: David L. Frieded
Phone: (312) 638-0508

Monday, June 15, 1992

IITRI Productivity Center
10 West 35th St.
Chicago, IL 60616
Contact: Dr. Keith McKee
Phone: (312) 567-4800

Wednesday, June 17, 1992

Foote Jones/Illinois Gear
2102 N. Narchez Ave.
Chicago, IL 60635
Contact: Fritz Hollenbach
Phone: (312) 622-8000

GEAR MANUFACTURING COMPANIES
ADVISORY COMMITTEE MEMBERS

DAVID L. FRIEDEL
VICE-PRESIDENT
CHICAGO GEAR - D.O. JAMES CORP
2823 W. FULTON ST.
CHICAGO, IL 60612
312 638-0508
FAX-312 638-7161

FREDERIC M. YOUNG
PRESIDENT
FOREST CITY GEAR
P.O. BOX 80
11715 MAIN ST.
ROSCOE, IL 61073
815 623-2168
FAX-815 623-6620

KEITH E. MCKEE
DIRECTOR
THE MANUFACTURING PRODUCTIVITY CENTER
IIT RESEARCH INSTITUTE
10 WEST 35TH STREET
CHICAGO, IL 60616
312 567-4800

J. JOSEPH TOKICH
MANAGER-QUALITY ASSURANCE
AIRCRAFT GEAR CORP.

RICH WILSON
QUALITY CONTROL MANAGER
BISON GEAR
2424 WISCONSIN AVE.
DOWNERS GROVE, IL 60515
708 968-6400
FAX-708 968-3049

BIPIN N. DOSHI
PRESIDENT
SCHAFER GEAR WORKS INC.
814-820 SOUTH MAIN STREET
P.O. BOX 986
SOUTH BEND, IN 46624
219 234-4116
FAX-219 234-4115

DALE WIERS
~~BALO WEIRES~~
MANAGER
MANUFACTURING ENGINEERING
HEAT TREAT, PLATING & ASSEMBLY
LITTON PRECISION GEAR
4545 S. WESTERN BLVD.
CHICAGO, IL 60609
312 847-4211

GEHRIG N. GODLEY
MANAGER OF ENGINEERING
AIRCRAFT GEAR CORPORATION
CHICAGO DIVISION
6633 W. 65TH STREET
CHICAGO, IL 60638
708 594-2100
FAX-708 594-8310

H. CAM WATSON
TOOL CRIB SUPERVISOR
OVERTON GEAR AND TOOL CORPORATION
530 WESTGATE DRIVE
ADDISON, IL 60101
708 543-9570
FAX-708 543-7440

DARYL W. GARRETT
PRODUCTION MANAGER
SCHAFER GEAR WORKS INC
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P.O. BOX 986
SOUTH BEND, IN 46624
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FAX-219 234-4115

SEROPE KALPAKJIAN
PROFESSOR OF MECHANICAL ENGINEERING
ILLINOIS INSTITUTE OF TECHNOLOGY
CHICAGO, IL 60616
312 567-3185

(6)

SCHAFER
GEAR WORKS INC

Bipin N. Doshi
President

814-820 South Main Street
PO Box 986
South Bend, IN 46624
Phone 219-234-4116
FAX 219-234-4115

(5)

BISON GEAR

2424 Wisconsin Avenue • Downers Grove, IL 60515
(708) 968-6400 • FAX: 708-968-5049

Rick Wilson
Quality Control Manager

(7)

Litton
Precision
Gear

Dale Weires
Manager
Manufacturing Engineering
Heat Treat, Plating & Assembly

4545 S. Western Blvd.
Chicago, Illinois
60609

312 847-4211

(4)

J. JOSEPH TOKICH
MANAGER - QUALITY ASSURANCE
AIRCRAFT GEAR CORP.

(1)

DAVID L. FRIEDEL
Vice President

D.O. JAMES
CHICAGO GEAR • D.O. JAMES CORP.
2823 W. Fulton St., Chicago, IL 60612 312/638-0500
Telefax 312/638-7161

(2)

Daryl W. Garrett
Production Manager

SCHAFER
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814-820 South Main Street
PO Box 986
South Bend, IN 46624
Phone 219-234-4116
FAX 219-234-4115

(3)

AGC

GEHRIG N. GODLEY
MANAGER OF ENGINEERING

AIRCRAFT GEAR CORPORATION
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(708) 594-2100 Fax (708) 594-8310

(9)

erton
Gear and Tool Corporation
530 WESTGATE DRIVE • ADDISON, IL 60101

H. CAM WATSON
TOOL CRIB SUPERVISOR

TELEPHONE
708/543-9570
FAX #708/543-7440

312/567-4847
Fax: 312/567-4329

The Manufacturing Productivity Center
IIT Research Institute
10 West 35th Street
Chicago, Illinois 60616

Keith E. McKee, Director
312/567-4800

(3)

Thomas Fehl
Senior Engineer

IIT Research Institute 10 West 35th Street Chicago, IL 60616-3799

312/567-4264
Fax: 312/567-4329

(2)

Frederic M. Young
PRESIDENT

Therese Philippi
Senior Business Analyst

IIT Research Institute 10 West 35th Street Chicago, IL 60616-3799

P.O. BOX 80
11715 MAIN STREET
ROSCOE, IL 61073
(815) 623-2168
FAX (815) 623-6620

(11)

SEROPE KALPAKJIAN
PROFESSOR OF MECHANICAL ENGINEERING
ILLINOIS INSTITUTE OF TECHNOLOGY

CHICAGO, ILLINOIS 60616

(312) 567-3183

IIT Research Institute
10 West 35th Street
Chicago, Illinois 60616-3799

312/567-4000

Minutes of the Gear Certificate Program Review
March 18, 1992
IIT Center
Chicago, Illinois

A luncheon meeting was held on March 18 to review INFAC educational development. The attendees introduced themselves--copy of business cards are attached.

Fred Young, chairman of the AGMA Small Gear Makers Committees, described the educational activities of that committee. This included the setup training facility. These training facilities are being setup by the AGMA committee at INFAC.

Prem Sud of the Chicago City Colleges described the Manufacturing Technology program being developed at Daley College. This is an associate degree program. There is already a certificate program for multispindle screw machine. Specifically, he described the planned certificate program that is being developed. The attendees were given a packet of material on this program and asked to make written comments. He further invited the gear companies to serve on an advisory panel for Chicago City Colleges.

A copy of the handout material is attached to these minutes.

Respectfully submitted,

Keith E. McKee, INFAC
Education Manager

Manufacturing Technology

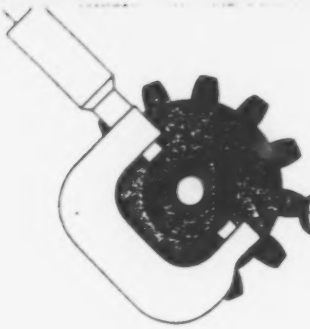
Basic Certificate in Gear Manufacturing

Subject	Course No.	Credit Hrs.	Proposed Credit Hr
Mathematics	107		5
Engineering (Blue Print Reading, Drafting, tollerances, graphics, etc.)	131		3
Manufacturing Technology (Gear Metrology)	115		3
Manufacturing Technology (Intro. to Gear Manufacturing)	116		4
Manufacturing Technology (Gear Manufacturing)	117		4
		TOTAL	19

Manufacturing Technology

Advanced Certificate in Gear Manufacturing

Subject	Course No.	Credit Hrs.	Proposed Credit Hr
English	101		3
Mathematics	107		5
Philosophy	116		3
Manufacturing Technology (Intro. to Q.C.)	103		3
Engineering (Blue Print Reading, Drafting, tollerances, graphics, etc.)	131		3
Manufacturing Technology (Gear Metrology)	115		3
Manufacturing Technology (Intro. to Gear Manufacturing)	116		4
Manufacturing Technology (Gear Manufacturing)	117		4
Business	111		3
or			
Business	274		(3)
		TOTAL	31



erton

Gear and Tool Corporation

530 WESTGATE DRIVE · ADDISON, ILLINOIS 60101

Area Code 708-543-9570

AMERICAN GEAR MANUFACTURERS ASSOCIATION

— Appendix U

May 26, 1992

Mr. Prem S. Sud
Director of Manufacturing Technology
Richard J. Daley College
7500 S. Pulaski Road
Chicago, IL 60652

Dear Mr. Sud:

I have asked a number of our supervisors to examine the curricula for the gear manufacturing classes that are going to be offered at the City College of Chicago, and overall they think they are excellent.

A couple of suggestions are that you add some time to discussing gear nomenclature and gear geometry, plus cover specific gear manufacturing equipment such as hobbers, shapers, shavers, gear tooth grinders, lead and involute checkers, etc., in Course 116.

If we can be of any further assistance, please do not hesitate to call upon us.

Sincerely,

Robert F. Roller

Robert F. Roller
Vice President

RFR:ps

cc: C. Brannen
C. Watson

D.O. James
Chicago Gear • D.O. James Corporation
2823 W. Fulton St., Chicago, IL 60612

April 24, 1992

To: Prem S. Sud
Director of Manufacturing Technology
Richard J. Daley College
7500 S. Pulaski Road
Chicago, Illinois 60652

From: David L. Friedel
Vice President
Chicago Gear D.O. James Corp.
2823 West Fulton Street
Chicago, Illinois 60612

Subject: Gear Manufacturing Certificate

Dear Mr. Sud:

Thank you for inviting me to the Education Review Board Lunch and Meeting on March 17, 1992. I found your presentation very interesting. The City Colleges of Chicago, Daley College, the E.D.C. and yourself are to be commended for your efforts to better assess and address the needs of the city's students and employers - particularly in the industrial sector.

It is exciting that a gear manufacturing curriculum is being developed. Hopefully a program comparable to the one developed for screw machining will eventually evolve. The overall content of the program design looks good. I would like to address each of the components and courses suggested.

Academic Component

No course outlines were given for the four courses of English 101, Math 107, Philosophy 126, and Engineering 131. I would like to review these if possible.

Philosophy 216 is an intriguing choice and I wonder what is the rationale behind it. Industrial Psychology comes to mind as possibly being more appropriate. I would like to see a course that includes what traits and values an employer seeks in his employees. A few that I would offer are dependable; cooperative; able, willing and eager to learn, knows how to ask questions to learn; honest, fair, conscientious, and takes pride in himself and his work.

Telephone (312) 638-0508 • Telefax (312) 638-7161

Technology Component

Manufacturing Technology 115 - Gear Metrology

While the expense would be increased, students should learn to use measuring tools in metric as well as the inch system. The U.S. will soon be converting to metric out of necessity to keep in step with the world market. Hopefully Math 107 will include instruction in the metric system as well.

The course outline under IV. Fixed Gages, should include Composite Spline Gage, under VIII. Gear Testing, lead checker should be added.

Manufacturing Technology 116 - Introduction to Gear Manufacturing Shop

Salem Company, P.O. Box 237 Woodstown, New Jersey 08098-0237 publishes the Industrial Gear Training Course #1 that is an excellent 84 page self study manual on gearing. This could be offered as part of this course or may be better as part of Engineering 131 as a prerequisite to the technology courses.

Course Outline

VII. Turning Machine Group - This section should teach what is important in turning a gear blank and how the turning operation affects gear quality. Though not specified, I consider it a must that proper set-up procedures and techniques be emphasized in the turning operation. These same principles apply to setting up for gear cutting.

X. Introduction to Gear Making Machinery - There are no details provided. Will this include feeds and speeds and corresponding materials and hardnesses?

XII. Grinding Machines - Only surface grinding is mentioned. An introduction to I.D. and O.D. grinding - at least what they are, why used, and the machine types, would be appropriate.

Manufacturing Technology 117 - Gear Manufacturing Technology

Course Description: No reference is made to materials, other than powder metal. The different materials used to manufacture gears along with their different heat treat processes should be taught. The material used implies heat treat and manufacturing methods, invaluable knowledge to a person involved in making gears. Knowledge of materials and their machinability, feeds and speeds for machining materials, and their design and wear characteristics are very important.

Course Outline:

III. Forming Processes - Weldments for gear blanks should be included.

VII. Machining Processes - I would prefer this to be titled Gear Cutting Processes. What machines are covered? Shapers and Shave machines need to be introduced. I would hope that this topic explains how different gear cutting machines work. Once again, proper set-up procedures on gear cutting machines and gear cutting tools is necessary. The sharpening of gear cutting tools is hopefully introduced as well.

VIII. Heat Treating of Gears: Materials should be an integral part of this instruction.

X. Finishing Processes: Skiving is a process to be taught under this topic.

Manufacturing Technology 103 - Introduction to Quality Control

Hats off for making this course part of the curriculum! My only recommendation is to emphasize that quality in a product begins with quality in the individual.

Conclusion

Overall, an excellent program has been designed. Many of the suggestions made here may have already been considered and included in the course contents.

All of my comments are meant to be positive and are offered in hopes of making the gear certificate as beneficial as possible for all concerned. The use of O.D. as an abbreviation for organizational development can be confusing to people in industry, as this usually refers to outside diameter. The presentation of the material is marred by many misspellings, typographical errors, and wrong words used. An institution of higher learning should have high standards that includes proofreading before releasing a publication.

This program is exciting and needed. I am looking forward to working with you as needed. This program and the AGMA Gear School that is being developed should be complimentary and mutually serving.

Respectfully,

David L. Friedel

David L. Friedel
Vice President

DLF/sc

The Manufacturing Productivity Center
IIT CENTER / 10 WEST 35 STREET / CHICAGO, ILLINOIS 60616 / 312/567-4800

DR. KEITH E. McKEE, MPC DIRECTOR
MRS. SHIRLEY J. McCUMBER, SECRETARY TO THE DIRECTOR
MRS. CAROL J. SESSIONS-ROBINSON, MPC EDITOR

March 20, 1992

Dr. Prem Sud
Director of Manufacturing Technology
Daley College
7500 South Pulaski Road
Chicago, IL 60652

Dear Prem:

I thought that the March 18 luncheon went very well. There were 12 gear company executives in attendance as an advisory committee for the gear manufacturing certificate program. I wrote brief minutes of the meeting which will be distributed along with a listing of all of the attendees.

Your briefing went well and I am certain that you will get written comments from most, if not all of the attendees. I would consider all 12 industrial attendees as the CCC advisory committee and invite them to subsequent meetings. If needed, INFAC can help to line up additional or alternate industrial representatives. I thought that the meeting arrangements went well and we can duplicate that for subsequent advisory committee meetings.

The advisory committee has four particularly interesting members--the representatives of Forrest City Gear, Chicago Gear, and Schafer Gear were at INFAC that morning for a meeting of the AGMA Small Gear Manufacturers Committee chaired by Fred Young, president and owner of Forrest City Gear. This is the committee that had decided that the small manufacturers needed a place to send employees to get training in gear manufacturing. INFAC agreed to provide the site for this training on the condition that the equipment be made available for the City Colleges and IIT students.

This AGMA committee has been obtaining and installing the equipment, identifying instructors and, in general, preparing to offer courses this summer. The companies are committed to sending employees for a week-long course paying a tuition of $500 per student. A class would consist of 10 to 20 students and there might be four classes per year.

The committee has been planning to handle all of the arrangements itself, but they are starting to realize that they cannot handle all of the details. When I tentatively suggested that they might want to consider having CCC conducts these courses, they were very interested. Clearly there are many questions, but in concept this could prove ideal for AGMA and for CCC.

- The offering of a nationally advertised course by CCC would obviously be good for CCC's image.

- One can always buy image, but in this case it would seem that it would be money producing. The companies are prepared to pay $500 per student and will guarantee a minimum of 10 students per class and they are planning on four classes per year. Assuming only 10 students per class, the total income

would be $20,000. AGMA thinks that suitable part-time instructors can be obtained for $100 per day. Assuming two instructors, one for theory and one for shop, this would mean that cost of instructors would be $4000 for the four sessions. This salary sounds low to me, but even if it is double that, the instructional costs would be $8000 against a minimum income of $20,000. AGMA planned to use the balance of the income for materials, maintenance, etc. The point is that the AGMA courses should be at least break-even.

- If CCC hires and controls these part-time instructors, they could offer a skill's course following the program offered to AGMA members. The AGMA companies should be anxious to hire these students--it would be less expensive for the companies and the training would be the same.

- The AGMA facilities will be used for the CCC certificate program--presumably the same instructors could be used.

- The facilities would also be used for associate degrees and IIT courses. For these courses the part-time instructors could teach the laboratory sessions.

The tight interaction with the gear industry would provide preferred placement of CCC graduates with gear companies nationwide. CCC would be the established source of new hires, which could be very positive. There were also inquiries and discussions about cooperative education, summer employment, company-supported students, and company employees sent to be students.

If CCC is interested, this could be an opportunity to posture CCC as the national training center for gear manufacturing. This would be a service INFAC could provide to the industry and would give CCC national credibility with the gear industry. Obviously, it would require analysis and planning, but it should be possible to get most, if not all, of the funds required from the industry. Most important of all, this would assure employment opportunities for CCC students who have taken gear related courses. At least in my view, the fact that many of these opportunities would be outside of Chicago is a positive--it would broaden opportunities for CCC graduates. I apologize for this meandering letter. There would seem to be an opportunity for CCC to expand its services to the gear industry locally and nationally. As was demonstrated by the March 18 interactions, this would rapidly spread to other manufacturing specialties, e.g., Bipin Doshi also owns a screw machine company and is interested in those students. All of this would seem very positive for CCC and most important for the students. I assume that all of this could be done under CCC's charter, policies, etc., but that clearly should be checked. Assuming that CCC is interested, the near-term next step would be to arrange to interview candidates for instruction in conjunction with the AGMA committee and at that point to offer to administer those courses for AGMA under their guidance and direction.

Regards,

Keith

Keith E. McKee
Director

cc: JJackson
KMcKee
CSpoor
KWade

— Appendix W

Gear Manufacturing News

Published by the Instrumented Factory for Precision Gears (INFAC)
IIT Research Institute
10 West 35th Street, Chicago, Illinois 60616-3799
312/567-GEAR

Volume 5, No. 2

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CURRENT AWARENESS BULLETIN

INFAC Board Meeting Highlights Machine Tools on the Way!

Cincinnati Milacron Will Help Equip the INFAC Shop Floor

At the board meeting held on March 26, 1992, at Arlington, Texas, INFAC program manager, Dr. Jared Jackson said that the equipment acquisition phase of the program was complete and that negotiations had been concluded with Cincinnati Milacron to supply all 11 pieces of equipment required to complete the INFAC shop floor that would enable making parallel axis and spiral bevel gears to accuracy levels better than AGMA 12. The negotiations have been long and tedious, but now INFAC can take very positive steps forward in manufacturing demonstration gears. Although much has been accomplished in the areas of factory floor modeling, education, and research and development tasks, the factory floor has always had the greatest visibility. He thanked the Coalition for their continued interest in the INFAC program without the machines in place and expected that the program would "snowball" with this key element added to the program.

Mr. Kevin V.G. Bevan, Cincinnati Milacron

Mr. Kevin Bevan, Cincinnati Milacron project manager for INFAC, said that Milacron had a strong interest in the program and that instead of simply selling their own equipment to go into INFAC they had negotiated with all other OEMs to make one package to lease all the equipment to INFAC. Milacron will not only arrange for the equipment to be placed on order, but will supervise the testing of the complete machine tools in conjunction with INFAC, arrange for delivery to the INFAC site, and install and retest the equipment. They will also be responsible for maintenance of all equipment and arrange for training on the machine tools.

There is also a quick turnover feature in the lease whereby equipment is changed as improved machines become available. Kevin said that his company is looking forward to close involvement with the INFAC program and expects to help by providing expert help that INFAC will not have to have on staff. He expected the U.S. machine tool industry involved with gears to benefit from the relationship.

The INFAC board chairman, Mr. Joe Arvin, commended the Milacron approach to coordinate equipment supply with their future support of the INFAC program.

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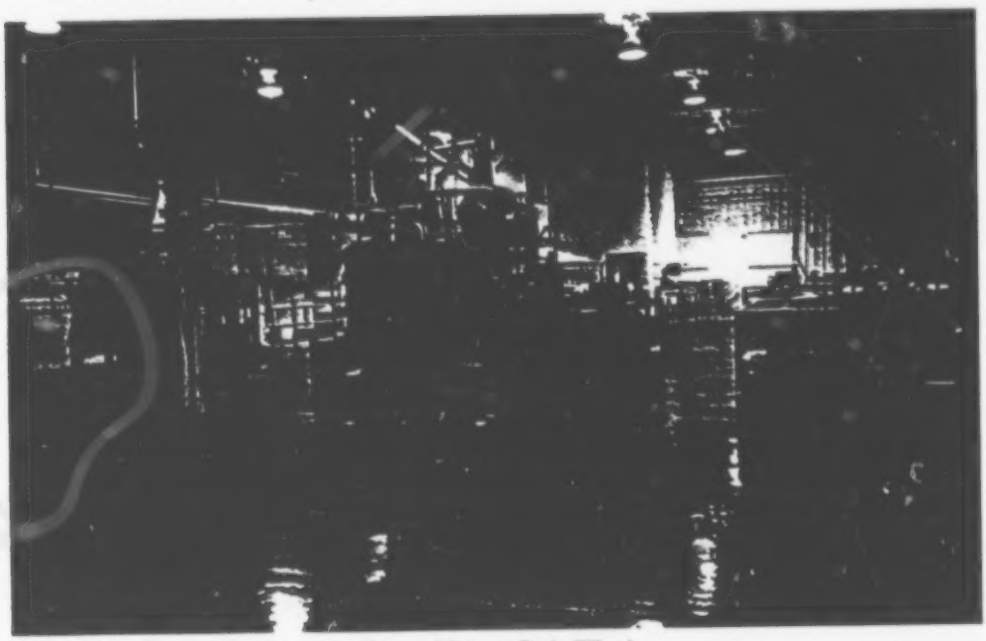
INFAC Board Meeting Highlights (cont.)

New Proposal to Locate INFAC Heat Treatment Center at Melrose Park

At the INFAC board meeting it was announced by Maurice Howes, chief scientist, that INFAC had been considering a proposal from Lindberg Heat Treating Company at the now closed Process Development Center at Melrose Park, Illinois. This is a special purpose small heat treatment factory (8,640 sq ft) already equipped with an intregal quench furnace line, and the pit carburizing line and press quench line can easily be added. The equipment on site is under full computer control (CAHTS), and all additional equipment would be added to the control system.



Lindberg Process Development Center, Melrose Park, Illinois

Howes said, "This arrangement removes most of the risk involved in remodeling existing buildings and allows much more equipment to be added to the center. We could start carburizing INFAC demonstration gears tomorrow." The State of Illinois, which is providing $1 million to rehabilitate and equip the center, has approved the change of venue and believes it will serve the State's interest better. Operating funds are being sought from Government sources to complete the arrangements for the center.

One research program that will be carried out at the center is the development of prediction methodology for distortion control after heat treatment and quenching. This program will be done in conjunction with the National Center for Manufacturing Sciences (NCMS) and its main supporters: Ford, GM, the Gear Research Institute, and the National Laboratories. INFAC enables control of the process from blanks to finished gears and allows full documentation so that a very complete model can be constructed. Distortion has plagued industry for as long as quenching has been carried out, and the prediction methodology will benefit all industry that uses this type of processing.

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INFAC Board Meeting Highlights (cont.)

INFAC Education Review Board (ERB) to be Restructured

You are invited to be a part of this activity!

Rodney Allwood, Director of Education at ASM International and Vice Chairman of the ERB, said at the INFAC board meeting that more emphasis was to be given to education to help the gear industry. He has been working with the INFAC staff to define needs and restructure the ERB activities. The first priority will be to get quality education products to the industry quickly.

Four subcommittees will be formed to cover the major ERB activities, and the ERB needs additional members with emphasis on those representing industry. We are inviting readers to study the activities listed below and decide which subcommittee they wish to support. Then please contact Keith McKee, 312/567-4800, INFAC Education and Training Manager, to discuss your part in furthering gear industry education projects.

ERB Technical Information Subcommittee

The purpose is to provide INFAC member companies with current, evaluated bibliographic information related specifically to gears and the gear industry on areas defined by the Subcommittee. The Subcommittee will determine the means for collecting and disseminating this information, and will be responsible for submitting all recommendations to the ERB for approval.

ERB Seminar Subcommittee

The purpose is to provide INFAC member companies with access to quality continuing education seminars on topics of value to the INFAC membership. This may be in the form of alerting members about existing education/training courses or constructing quality short courses offered under the auspices of INFAC. The Subcommittee will be responsible for determining training needs, constructing course descriptions, and submitting all recommendations for such training to the ERB for approval.

ERB Community College Subcommittee

The purpose is to collect, review, and disseminate information on developments (e.g., program and course designs) related to community college-based training in gear manufacturing and metalworking. The Subcommittee will determine methods to be employed to achieve this purpose, and will be responsible for submitting all recommendations, as well as periodic reports, to the ERB for approval.

ERB Training Research Directory Subcommittee

The purpose is to collect, review, and disseminate information on gear manufacturing and coordinate training programs, such as those offered by companies and professional societies. The Subcommittee will determine methods to be employed to achieve this purpose, and will be responsible for submitting all recommendations, as well as periodic reports, to the ERB for approval.

The next ERB meeting will be held on Monday, June 22, 1992, in Hermann Hall at 33rd and Federal Streets, Chicago, Illinois, at IIT Center starting at 9:30 a.m. There will be a reception at 4:30 p.m. to enable further information discussions. The INFAC Coalition meeting starts on the next day (see page 4).

E R B M E E T I N G

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COALITION MEETING

New Format for Next INFAC Coalition Meeting

The format of the Coalition meetings will change by concentrating the meeting efforts around one or more principal technical components of the INFAC program. The June 23-24, 1992, Coalition meeting will focus on modeling as a useful analytical approach to understanding and improving precision manufacturing. The agenda will consist of specific technical presentations and formation of a working group aimed at demonstrating the benefits of activity modeling in assisting the precision gear industry.

The visible portion of the INFAC program involves establishing a precision gear research facility capable of manufacturing gears. The INFAC program has selected four gears to "demonstrate" the manufacturing capabilities and flexibility of the research factory equipment. Activity models of the demonstration cycle gear manufacturers will be used by INFAC personnel to document the precision gear manufacturing process.

- The models allow the gear manufacturers to convey the steps required to produce a precision gear for the INFAC program.
- The models identify and quantify possible problem areas that determine INFAC research projects.
- Models developed by INFAC portraying future or changed operations will assist the implementation of new technology.
- Models diagramming new technology or techniques can highlight the risks to manufacturers and provide information in deciding which technology is best to implement.

This meeting format provides an opportunity for different personnel from the Coalition companies to participate.

As with previous meetings, the INFAC Coalition meeting will be open to all Coalition members and invited guests. The specific technical content and nature of the modeling conference may be of interest to persons who have not attended these meetings in the past. Coalition representatives at each company are requested to identify and inform personnel that would gain the most from attending an activity modeling conference.

Attendees to the modeling conference should be interested in the modeling approach and analysis of models as a means to evaluate manufacturing or business problems and to identify improvement opportunities. Personnel from the manufacturing, engineering, and business planning functions within each organization who desire to enhance their knowledge of structural analysis techniques such as modeling may benefit.

Topics to Be Covered

Currently, the INFAC program is involved in several projects using activity modeling as an analysis tool. These projects involve: the gear industry, academia, and consultants.

The modeling conference will address the technical, business, and cultural issues of activity modeling.

The conference will cover the technical aspects of gear manufacturing from an "above the shop floor" or factory-wide viewpoint. Modeling discussions will range from approach differences, to industry problem similarities, to the impact of possible procedural changes within a company.

Modeling Working Group

A working group meeting is scheduled for the research project leaders at the conclusion of the conference to discuss (1) model integration between projects, (2) benefits of "varied" approaches to similar problems, and (3) generation of reference models for the gear industry.

If you have particular interest in the above three topics, please indicate your desire to attend the working group meeting. Requests for invitation should be made to Ms. Aimee Dobrzeniecki, INFAC Modeling Task Manager, 312/567-4962. For Coalition meeting registration information call Ms. Doris Dickson at the INFAC office, 312/567-4653.

Gear Training School's Future Depends on YOU--Contributions and Instructors Needed for Summer Session

"We've been frustrated by offers to train our operators on state-of-the-art equipment, displayed at trade shows and manufacturing training seminars, in which the instructional focus is on learning the features of new machine tools. What seems to be lacking at these gatherings is a practical 'how to use' approach that can be applied to increase productivity of the machine tools we already have in our plants. This 'How to' approach is precisely what the AGMA Small Business Manufacturers Committee's (SBMC) new gear school has to offer," according to SBMC Chairman Fred Young. This school offers a practical "how to use" approach that can be applied to increase productivity of conventional machine tools.

The objective of the new Chicago-based gear school at INFAC is to provide a facility for appropriate and affordable hands-on setup training on traditional gear machines. It will provide entry-level gear machine operators with a solid educational foundation for setting up and properly using hobber, shaper, and inspection equipment. After this fundamental program is well established, courses at intermediate, advanced, and instructor levels will also be offered.

"Our intent is to provide graduates with the tools to boost his or her company's usable output, productivity and quality," according to Young. The SBMC is moving at a fast pace to prepare for this summer's first session, but the committee has a long way to go in terms of securing necessary contributions for the school--the committee needs your help!

In addition to soliciting funds and equipment contributions, the SBMC is looking for hands-on instructors to teach on basic 6 in. hobbing machines, gear shapers and inspection equipment. (All instructor positions are paid.) The following equipment (all of which should be in reasonably good operating condition, preferably with supporting tooling) is needed:

- Three Barber-Colman hobbers with change gears and arbors
- Two Fellows shaper #7 size or 7125A with internal shaping capability, change gears and arbors
- Manual red line roller (Fellows, Parkson, Variroll, Illinois Tool Works, or equivalent) size 4 to 8 in.
- Tool and cutter grinder (any make) size: 6 in. diameter capability
- Starett, Brown & Sharp or other make micrometers and calipers of various sizes up to 6 in.
- Starett surface plates (or equivalent) size: 24 in. x 36 in.; indicator (.001 in.) with stand
- Optical comparator with up to 14 in. diameter screen, Johns and Lampson (JRE) or equivalent
- Barber-Colman 2 1/2-4 or size up to 6-5 hob sharpener
- Jo blocks; bench centers; measuring wires; Van Keuren and change gear ratio books
- Roll pins and fine pitch master gears

Please call one of the committee members for authorization prior to making any equipment contribution: Fred Young (815/623-2168), Bipin Doshi (219/234-4116), or David Friedel (312/638-0508).

First machines for the school being unloaded at INFAC.

GEAR SCHOOL

HEAT TREATING CONF.

13th Heat Treating Conference & Exposition

The 13th Heat Treating Conference & Exposition was held at the Cincinnati Convention Center, Cincinnati, Ohio, on October 22-24, 1991. The Heat Treating Division of ASM International sponsored this event, held in conjunction with ASM International's Materials Week '91.

The conference opened with a plenary session entitled "America Responds to the Quality Challenge," featuring two speakers from the aerospace and automotive industries. Mr. Art Welch, from Martin Marietta Corporation, addressed their participation in Operation Desert Storm. Martin Marietta supplied our forces with the LANTIRN (Low Altitude Navigation & Targeting InfraRed for Night) electro-optical system, the Patriot missile, and TADS/PNVS (Target Acquisition & Designation Sight/Pilot Night Vision Sensor)/Apache Helicopters. These products and system proved to be most reliable and quickly available. Mr. J. Patrick McCormick, of the Cadillac Motor Car Company, reviewed their efforts toward manufacturing quality products, and Cadillac's recognition as the first automotive manufacturer to receive the Malcolm Baldridge National Quality Award.

The session on **Atmospheres Applications Using Computer Models** was chaired by P. Johnson of National-Standards, in Niles, Michigan. The paper, "Finite Difference Computer Models for Two Stage Vacuum and Gas Carburizing Heat Treatments," was presented by R. D. Sisson, Jr., from the Worcester Polytechnic Institute, Worcester, Massachusetts. This paper presented the development of a computer model that can predict the carbon concentration profiles as a function of time in selected steels. This model can calculate the required times and atmosphere needed to obtain the desired carbon concentration during the boost/diffuse process. The paper, "Superior Heat Treatment Using Furnace and Load Computer Modeling," was presented by M. Roberts, of Liquid Air Technology Center, Countryside, Illinois. This paper evaluated a computer model which could visualize the impact of atmospheres on furnaces and load configurations. The presentation entitled "An Integrated Process Control System for Quality and Productivity Improvement at Carburizing" was written by T. Holm, AGA Innovation; U. Blane, Philips GmbH; B. Holmlund, Brukens Sverige AB; and Ulf Sabelstrom, Ovako AB (all companies are from Sweden). This paper reported the developments of a joint venture of the four companies in producing a fully automated heat treatment system which handles customer ordering to process supervision and control. Philips built the complete system. AGA developed the software for equilibrium and kinetic calculations and provided a system to regulate gas flow and mixture. Ovako supplied hardenability calculations software. Brukens, the end user of this system, contributed their industry experience in the areas of process supervision, quality assurance, and statistical control.

The **Induction Heat Treatment in Manufacturing Cells** session was chaired by Mr. D. E. Bowman of Caterpillar Inc., East Peoria, Illinois. The paper, "Induction Hardening of Wheel Spindles in Manufacturing Cells," was presented by Mr. Jim Behrendsen of Delco Moraine NDH, Sandusky, Ohio. This paper presents the implementation of in-line heat treatment in a manufacturing cell. It took Delco four design phases to transfer from traditional to fully automated heat treatment in a cell. The cell which produces wheel spindle bearing components consists of a machining station, induction hardening and tempering, and a grinding station. One operator, supervising machine status and parameters controls, is responsible for this cell. The paper, "Heat Treating in Barstock Manufacturing Cells," was presented by Mr. Gary Bevilacqua of Caterpillar Inc. York, York, Pennsylvania. Caterpillar York is also transferring to manufacturing cells combining the heat treatment facility with machining. The reasoning for this integration is to optimize control in the process and inventory, reducing product lead time. Areas addressed included the flexibility of batch/individual processing, setup time, process control, floor space, and operator training.

The **Quality Improvement: Philosophies and Practices** session was chaired by Mr. M. Appel of Dana Corporation, Ft. Wayne, Indiana. The paper entitled "Companies that Target World Class are Destined to be Second Rate" was presented by Mr. Mark Whatley of the Ford Motor Company -SQA, Ypsilanti, Michigan. Mr. Whatley emphasized the need for U.S. industry to set its targets beyond what is currently considered "world class." By aiming toward your competitor's current status, you give that competitor the opportunity to develop and expand control of the market. The objective should be to target beyond what the competitor is currently marking. The paper, "Quality Improvement Through Process Control Feedback," was presented by Mr. Terry Brown of Lindberg Heat Treating, Rolling Meadows, Illinois. Mr. Brown stated how consistent high quality can be provided through repeatable processing. He

stressed that repeatability can be obtained with the implementation of process control feedback in a manufacturing facility.

Complementing the conference session was the 13th ASM Heat Treating Exposition and the 5th ASM/TMS Materials Exposition. Over 330 exhibitors displayed their new products and developments, services, materials, process and quality control, automation, and business management tools. The new equipment displayed in this exposition included furnaces, tooling, and software. Materials handling systems featured the integration of programmable logic controllers and robotics.

For more information, please contact:

ASM International
Materials Park, OH 44073-0002
216/338-5151; 216/338-4634 (Fax)

CONF.

IMIP End-of-Project Briefing at Litton Precision Gear

Having just concluded the first phase of an Industrial Modernization Incentives Program (IMIP), Litton gave a briefing to industry and Government in Chicago on March 20, 1992. This program was done under subcontract from INFAC as part of the R&D program with the funding support by AVSCOM. Mr. Elmer Hill, president of Litton Precision Gear, opened the briefing by emphasizing that a successful program required the commitment of the whole company but the benefits were essential to the future of the company. He said "Unless you do this type of planning today, you won't be around tomorrow."

Richard Holder, the Litton IMIP manager, made the presentation and described how the program had been organized and the teams that were necessary. The program had cost $400,000-$500,000, but it was the best investment they could have made since Litton "plans to be around for a long time." Although they have finished this phase and hope to go on to Phase II (development of the enabling technologies and design of the factory modernization enhancements), they believe that these activities are a life-long activity since "however good you are you can always get better."

The Litton objectives are to:

- Reduce cost and improve quality
- Insure on-time deliveries
- Shorten lead times

The company strategy must be communicated to all staff; otherwise, you "will find them marching in different directions. It's the easiest thing in the world to make decisions, the hard part is getting them implemented." This also means complete union involvement. Hill commented that "the union has been very cooperative with the change process because we involve them deeply in the planning and take them with us to see customers." Remember that customers are the key. To keep satisfying them, continuous reiterations are necessary with the constant introduction of incremental improvements.

Litton did a very comprehensive process flow analysis and identified all the elements that contributed to costs, times, and distance traveled through the factory. They have designed a series of six "Focused Factories" to handle housings, small gears, large gears, large shafts, ring gears and carriers, and common areas. They believe that lead time can be reduced 50-70% - - i.e., from the current 300-450 days to less than 100 days. Distance traveled in the plant can be similarly reduced. They expect a significant payback in less than five years. They expect that this program will position Litton Precision Gear for the future and help make them the number one producer.

IMIP BRIEFING

MEETINGS

Future Meetings

The Society of Manufacturing Engineers (SME) has announced the following clinics to be held in 1992:

Fundamentals of Gear Design and Manufacture
June 9-10, Marriott, Schaumburg, Illinois

Advanced Gear Processing and Manufacturing
October 20-21, Detroit, Michigan

Details of these clinics can be obtained by calling Michael Traicoff, SME, 313/271-1500, ext. 596.

ASM International is holding Material Education Institute (MEI) seminars in the first half of 1992 on the following subjects of interest to gear manufacturers:

Heat Treatment of Steel
June 8-12, Materials Park, Ohio

International Conference on Quenching and Control of Distortion
September 22-25, Marriott's Lincolnshire Resort, Lincolnshire, Illinois

Further details on the international conference and the seminars can be obtained by calling ASM International, 216/338-5151.

The American Gear Manufacturers Associa... ...A) is holding the following meetings in 1992:

Gear Failure Analysis
June 3, Radisson Hotel, Detroit Airport, Romulus, Michigan

Bearing Failure Analysis
June 4, Radisson Hotel, Detroit Airport, Romulus, Michigan

Further details of the seand other meetings can be obtained by calling AGMA at 703/684-0211.

Gear Noise Course at Ohio State University

A three-day course on gear noise will be held at The Ohio State University, September 9-11, 1992. The course will cover general noise measurements and analysis, causes of gear noise, gear noise reduction techniques, dynamic modeling, gear noise signal an problem diagnosis, housing dynamics and housing noise radiation. Featured speakers will be Professors D. R. Houser and R. Singh of the Gear Dynamics and Gear Noise Research Laboratory at The Ohio State University and Dr. Robert Munro of Huddersfield Institute of Technology in England. Cost for the course will be $900. For further information, contact Miss Carol J. Bird, Conference Coordinator, 614/292-3204 or Dr. Houser at 614/292-5860.

INFAC
IIT Research Institute
10 West 35th Street
Chicago, Illinois 60616-3799

Nonprofit Organization
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Dr. Prem Sud
Director, Manufacturing Technology
Richard J. Daley College
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MINUTES
OF
INFAC EDUCATIONAL REVIEW BOARD (ERB) MEETING
June 22, 1992

In the Trustees Dining Room, Hermann Hall at IIT Center in Chicago, the meeting was called to order at 10:00 a.m. by ERB Chairman, Rod Allwood. A list of attendees is attached as enclosure 1. The agenda for the meeting is enclosure 2.

(1) Rod Allwood opened the meeting by observing that the INFAC educational program is an intimate portion of the overall INFAC program. This important point helps to keep the educational program in perspective. He also explained the approach for the balance of the day and distributed a revised agenda. Based on the broad interests of many attendees, the subcommittee subjects will be covered by the ERB in total. This will give everyone a chance to contribute and, in addition, will encourage considering the INFAC education program as a whole. The goal is to decide areas of potential contribution by the ERB and by the end of the day assign individuals to head those areas. A continuing ERB challenge is to develop action programs for the ERB that will attract and involve representatives of gear manufacturers and users. It is important to keep in mind that the INFAC educational program exists to help the gear industry.

(2) Jed Jackson, INFAC program manager, provided a status report on the overall program. Of primary interest is the receipt of five pieces of equipment at INFAC (worth $3M) during the week of June 15. Three of these pieces of equipment are in-place and being hooked up. The other two are awaiting removal of the 1000-ton press from the factory floor which is scheduled to be completed by mid-July. The M&M gear analyzer is to be delivered by the end of July and the Cincinnati grinder in August. All of this equipment is being leased through Cincinnati Milicron who has put together a coalition involving all of the equipment manufacturers. Cincinnati Milicron is responsible for installation, training, and maintenance of all the equipment. Cincinnati Milicron has effectively become a partner to INFAC with responsibility for the equipment. There will be a presentation on the equipment at 8:00 a.m. June 23 as part of the coalition meeting.

The rapid delivery of equipment has enabled INFAC to maintain the planned demonstration cycle schedule. Cycle 1 will be initiated during July. A six-month extension to the INFAC program plus the two option years will take the program to May 1995. During that period all four demonstration cycles will be completed as originally planned.

Dr. Jackson also reviewed for the ERB the planned activities over the first three days of this week. The ERB is meeting all day on June 22. The INFAC Research Review Board (RRB) is meeting on the morning of June 23. The coalition meeting is being held during the afternoon of June 23 and on the morning of June 24. The coalition meeting is focusing on modeling and simulation with those working for INFAC in these areas presenting their work. The INFAC Board will meet on the afternoon of June 24. Dave Williams, ERB Vice Chairman will represent the ERB at this board meeting.

Dr. Jackson described INFAC funding challenges. From the point-of- view of the educational program, short term funding limitations have resulted in delayed management and technology courses and put the INFAC library and information services in general on hold. These limitations should be overcome on October 1 allowing short courses and information services to be reactivated. Significant efforts have been made to track INFAC funding and to assure that it will be available. Overall, the information is very positive for INFAC's future.

The INFAC staff is being increased with people to operate and conduct experiments on the equipment. The above-the-floor aspects of INFAC are also of major interest. IBM's original equipment commitments to INFAC have not been forthcoming. There is no funding within the present contract to support the computer requirements. IBM is still involved in discussions, but other sources of support are also being pursued.

The status of heat treating was also reviewed. To this point the INFAC program has not been enlarged to include heat treating. INFAC has $1M from the State of Illinois which is going to be used to establish a heat treating facility at the Lindberg heat treating facilities in Melrose Park, Illinois. Present plans are to proceed with facility development with the expectation that research and operating funds will be forthcoming from DLA. A classroom is being added in Melrose Park. It was noted by

the group that this is a unique heat treating facility that has a large potential for heat treating education and training.

Dr. Jackson also talked about some INFAC activities that demonstrate its ongoing viability. INFAC is being suggested as a shared facility under the DoC program. INFAC is also being offered as a teaching factory under the National Center for Manufacturing Sciences (NCMS) program. Wisconsin is one of the four finalists for the NIST Manufacturing Technology Center and INFAC/IITRI are built into the Wisconsin team.

(3) INFAC education and training was covered by the group with many people contributing:

- Management and Technical Training has been on a "back burner" due to funding limitations within the INFAC program. The coalition meeting focusing on simulation is effectively such a program. It is expected that with funding available October 1 that this element of INFAC education and training will be reactivated.

- Serope Kalpakjian reviewed the university level course development. Of the planned courses only the CIM course has yet to be offered. That graduate course is scheduled for Fall 1992 and will be taught by Dr. John Cesarone of the INFAC staff. The Gear Design course will also be offered for the second time in Fall 1992. The Gear Design Course has been packaged and is available to other institutions. This also will be done within the next couple of months for the Gear Manufacturing Course.

- There was considerable general discussion about the use of INFAC for master and PhD theses. This is highly appropriate and should be considered by IIT and other universities involved with INFAC. Ideally a thesis could be developed at the home institution with final verification provided on the INFAC floor. Getting industry involved to support graduate students was also discussed. It was suggested that DLA may be prepared to work with industry to support appropriate candidates. There were discussions started about the need for identifying research areas so that companies and students would know what was needed. It was noted that establishing research needs and priorities

was within the charter of the RRB. This issue was to be raised by Jed Jackson and Dan Gearing who will be at the RRB meeting.

- The AGMA small gear makers course was described and discussed. The small gear makers committee of AGMA has been obtaining donated equipment which is being set up under the balcony on the INFAC floor. AGMA is handling curriculum and arranging for instructors. The first offering of this class will be in August or September. INFAC is providing space and helping to coordinate this effort. In exchange, the equipment will be available for use by the City Colleges of Chicago and Illinois Institute of Technology for other educational purposes. It was suggested that this facility with the instructor might be the basis for a video course to be developed by a professional society or trade association, e.g., AGMA, ASM or SME. The instruction would then be available to companies that were unable to have their employees attend the course.

- There were further discussions of video training. ASM has made training videos available to INFAC and other societies are expected to do the same. Arrow gear is also making their training videos available and other companies should also contribute. From these and other sources, INFAC will develop a significant video training library.

- Prem Sud, Director of Manufacturing Technology at Daley College (one of the City Colleges of Chicago) described their manufacturing program overall with emphasis on gear manufacturing. They are presently obtaining approval for two certificate programs - a basic certificate involving 25 credit hours and an advanced certificate involving 32 credit hours. They expect to begin these programs in Spring 1993. Skills courses can also be offered using the AGMA equipment located at INFAC. Within the City Colleges there is also an Associate of Science degree in manufacturing technology which has been initiated. This is being broadened and improved.

- McKee briefly described the concept of a Manufacturing Education Resource Center (MERC) which is evolving in Chicagoland. The AGMA gear training facility is one example that will be used directly by industry, for skill courses offered by City Colleges of Chicago, for certificate programs offered by the City Colleges, and as laboratories for manufacturing technology courses offered by both IIT and CCC. Similar facilities are already available for screw machines and are being

developed for CAD. The INFAC heat treating center offers another such MERC. Beyond that, funding is being sought to establish other MERCs (possibly in the INFAC building) for metal removal, metal bending, CIM, and quality control. Another educational initiative involves developing and offering a Bachelor of Manufacturing Technology (BMT) degree which would accept manufacturing related associate degrees as well as completed apprentice programs so that students could complete a BMT in two years.

(4) Following lunch the ERB toured INFAC facilities seeing the newly delivered equipment as well as the AGMA donated equipment. Rod Allwood and Dave Williams described the procedure used to develop the subcommittee subjects described in enclosure 2. The afternoon generated extensive discussion of the subjects selected, the organizations and the future. The result of these discussions was a revised ERB agenda involving five items:

- Community College Training, which is being developed by the City Colleges of Chicago with Richard J. Daley College taking the lead. This program is being directed by Prem Sud. With INFAC help an industrial advisory committee with 12 gear companies has been formed and the companies are providing input. This advisory committee will be considered as a subcommittee of the ERB and asked to report at future ERB meetings with Prem Sud of Daley College.

- The AGMA gear school is being directed by the AGMA Small Business Manufacturers Council chaired by Bipin Doshi, owner and president of Schafer Gear Works in South Bend, Indiana. This committee had had many meetings and is handling all of the activities involved in developing and offering courses for employees of their member companies. This AGMA council will be considered as a subcommittee of the ERB and asked to report at future ERB meetings.

- Undergraduate and graduate courses are being developed, offered, and prepared for export to other institutions by IIT under the direction of Serope Kalpakjian. There has been an unofficial advisory committee of peers at IIT and other institutions. Professor Kalpajkian,

with their input, has directed course development and reacted directly with the ERB. This approach will be continued.

- Community College/Industrial Interaction was the subject of extensive discussions. There are 1400 community colleges many of which likely interact with and serve gear manufacturers. It was suggested that INFAC work to list community colleges along with courses that they offer that could serve the gear industry. The approach might be a survey instrument sent to the community colleges. Allen Batteau agreed to provide leadership for this effort. John Mayer and Dave Williams offered to assist. This subcommittee was asked to investigate the possibility getting input from industry and community colleges as appropriate. They will report at the next ERB meeting.

- Seminar Definitions Leading to a Directory. There has been an expressed need for a directory of seminars, workshops, and short courses relating to gear manufacturing and related subjects. This could include one-day and multiple-day courses, videos, and in-plant training courses. There were extensive discussions of what should be included. If it were everything relating to gear manufacturing it would effectively be most materials relating to metalworking. Limiting coverage to certain areas of interest, e.g., heat treating was suggested. Before a directory can be prepared or even planned, there is a need to determine what is of interest. For that reason this subcommittee will emphasize definitions and attempt to "fence" what should be included. Dave Williams agreed to chair this subcommittee. John Mayer, Bob Roller, and Rod Allwood agreed to work with him. This subcommittee will be asked to report at the next ERB meeting.

The above five subcommittees will provide the organization for future ERB meetings. There was considerable discussion about information. It was concluded that the primary need was for a "quick response" source of information. The INFAC librarian when reactivated October 1 will provide this service with technical support for the INFAC staff. The INFAC library will collect and have available as much information as possible for gear manufacturing. This will include books, papers, catalogs, videos and other information. All INFAC generated reports and related documents will also be available through the library. There was considerable discussion about the INFAC role in searching

for and translating foreign literature and/or abstracts. It was the general consensus that this is needed for gears and for manufacturing in general, but it was concluded that funding for this was not available under the INFAC contract. The gear manufacturers have extensive overseas involvement so foreign progress is reasonably well known. One possibility discussed was for INFAC to sponsor an international conference on gear manufacturing which would involve technical leaders from all parts of the world.

The Chairman, Rod Allwood left at approximately 4:00 to catch his flight. The vice chairman, Dave Williams took over the chair for the remainder of the meeting.

Dave Williams will represent the ERB at the INFAC Board meeting on June 24. Old business included discussions of what might be done for greater industrial involvement. Each of the subcommittees is expected to involve industry in their activities and is encouraged to involve industrial participants at the next ERB meeting. It was also suggested that industry would become more involved when INFAC is up and running. The results of this ERB meeting will be covered in the next Gear News.

It was concluded that the next ERB meeting should be in conjunction with the fall INFAC Coalition Meeting. A half-day meeting will be held with each of the subcommittees reporting. Every possible effort should be made to involve industrial people on each subcommittee and to have industrial representatives involved in the ERB meeting.

Respectfully submitted,

Keith E McKee

Keith McKee

ENCLOSURE 1

LIST OF ATTENDEES

EDUCATION REVIEW BOARD MEETING

June 22, 1992

ASM INTERNATIONAL
The Materials Information Society

ASM WORLD HEADQUARTERS

Rodney W. Allwood
Director, Education

Materials Park, Ohio 44073-0002
216/338-5151
FAX: 216/338-4634
TELEX: 98-0619 ASMINT

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312/567-4952
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Wizdom Systems, Inc.
Computer Integrated Systems

Dr. Allen W. Batteau

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DAN GEARING
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703
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Eugene Rivin
Professor and Director
Machine Tool Research Lab
Mechanical Engineering

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ASSOCIATE PROFESSOR
EDUCATIONAL ADMINISTRATION
COLLEGE OF EDUCATION

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ENCLOSURE 2

AGENDA

EDUCATION REVIEW BOARD MEETING

June 22, 1992
Trustees Dining Room
Hermann Hall - Lower Level
33rd and Federal Street
Chicago, Illinois
IIT Center

9:30 a.m.	Coffee, Rolls, and Conversation	
10:00 a.m. (1)	Call to Order	Rod Allwood, Chairman Dave Williams, Vice Chairman
	Introduction of Members	
10:20 a.m. (2)	INFAC Status	Jared Jackson INFAC Program Manager
11:00 a.m. (3)	Current Educational Activities Management and Technical Training Illinois Institute of Technology City Colleges of Chicago AGMA	Keith McKee with help
12:00 (4)	Lunch	
	The subject of each planned subcommittee will be held as a committee of the whole	
1:00 p.m. (5)	Technical Information Subcommittee	
1:45 p.m. (6)	Seminar Subcommittee	
2:30 p.m. (7)	Community College Subcommittee	
3:15 p.m. (8)	Training Resource Directory Subcommittee	
4:00 p.m.	Discussions	
4:15 p.m.	Old Business	
4:30 p.m.	New Business	
4:45 p.m.	Adjournment	
	Dinner	

1. ERB TECHNICAL INFORMATION SUBCOMMITTEE

Purpose

The purpose is to provide INFAC member companies with current, evaluated bibliographic information related specifically to gears and the gear industry on areas defined by the Subcommittee. The Subcommittee shall determine the means for collecting and disseminating this information, and shall be responsible for submitting all recommendations to the INFAC Education Review Board for approval.

Description of Activities

There are a number of issues which effect the gear manufacturing industry including material selection, manufacturing technology, quality assurance, testing and failure analysis and much more. When placed in the larger picture of business concerns - financial, competition, environmental, etc. - access to accurate, current information is of paramount importance to gear manufacturers. The Technical Information Subcommittee operates as stated in its Purpose and within the objectives of the INFAC Education Review Board.

2. ERB SEMINAR SUBCOMMITTEE

Purpose

The purpose is to provide INFAC member companies with access to quality continuing education seminars on topics of value to the INFAC membership. This may be in the form of alerting members of existing education/training courses or by constructing quality short-courses offered under the auspices of INFAC. The Subcommittee shall be responsible for the determination of training needs, constructing course descriptions and for submitting all recommendations for such training to the INFAC Education Review Board for approval.

Description of Activities

The type of continuing education seminars to be considered by this Subcommittee are short training programs, normally 1 to 5 days in length. The Subcommittee will concern itself with all levels of gear manufacturing personnel (machinists, designers, engineers, etc.) and all types of gear manufacturing processes in its needs analysis activities. In situations where needs exist and no training programs exist, the Subcommittee will consider developing suitable seminars. In situations where needs exists and training programs of acceptable quality exist, the Subcommittee will identify such offerings and make them known to the Education Review Board for further action. Such action may encompass endorsement, co-sponsorship, member notification or no action at all.

3. ERB COMMUNITY COLLEGE SUBCOMMITTEE

Purpose

To collect, review, and disseminate information on developments e.g., program and course designs, related to community college-based training in gear manufacturing and metalworking. The subcommittee will determine methods to be employed to achieve this purpose, and will be responsible for submitting all recommendations, as well as periodic reports, to the INFAC Educational Review Board for approval.

Description of Activities

1. Compile information on cogent community college programs, both credit and non-credit, in the U.S. and Canada.

2. Serve as a resource for INFAC member companies seeking contact with community colleges, and seeking information, such as course and program outlines, to share with community colleges in their areas.

3. Contact INFAC member companies to determine training needs that can be met through liaison with community colleges.

4. ERB TRAINING RESOURCE DIRECTORY SUBCOMMITTEE

Purpose

To collect, review, and disseminate information on gear manufacturing and coordinate training programs, such as those offered by companies and professional societies. The subcommittee will determine methods to be employed to achieve this purpose, and will be responsible for submitting all recommendations, as well as periodic reports, to INFAC/ERB for approval.

Description of Activities

1. Compile company and professional society program announcements related to gear manufacturing training.

2. Plan and develop a directory of such programs.

3. Assist INFAC in determining whether and where it has a "niche" in the spectrum of such programs.

4. Periodically circulate the directory to INFAC member companies.

SAMPLE - FOR DISCUSSION PURPOSES ONLY

Guidelines for MSTP Work-Based Learning Sponsors

The sponsor will:

1. Interview and select apprentices from a pretested group;

2. Enter into a contractual agreement with the apprentice/s and Daley College.

3. Provide the apprentice/s with the remaining training experience needed to complete the apprenticeship.

4. Evaluate apprentice performance and issue certificates to apprentices who successfully complete the apprenticeship.

Chicago Commons Association & Daley College will:

1. Advertise for, screen, and test individuals to provide qualified candidates;

2. Assist the sponsor in apprentice/s selections;

3. Provide a 1350 hour on campus MSTP apprentice trades training program;

4. Provide staff and facilities for the MSTP program.

Daley College will:

1. Provide apprentice with insurance while on shop site performing Work-Based Learning duties at no cost to the employer/s.

Work-Based Learning Menu (page 1)

Please circle task numbers your shop would be most likely to assign apprentices to perform.

Task 1. Housekeeping & Safety

Task: Perform your shop's cleaning procedures and safety precautions.

1a. Clean floor
1b. Clean machine
1c. Other

Task 2. Work Habits & Attitudes

Task: Adhere to your shop's attendance requirements while performing your internship menu assignments.

2a. Absenteeism
2b. Tardiness
3c. Other

Task 3. Screw Machine Prints

Task: Check piece part tolerances as specified on blue prints.

3a. Inspect multiple spindle piece parts
3b. Inspect single spindle piece parts
3c. Sort reject piece parts
3d. Other

Task 4. Tool Crib Familiarization & Procedures

Task: Work in your shop's tool crib and distribute items needed for shop's operation.

4a. Distribute crib items per shop procedures
4b. Up date crib records
4c. Other

Task 5. Tool Grinding

Task: Perform tool sharpening assignments.

5a. Sharpen tools in use by setter/operators
5b. Sharpen tools in crib stock
5c. Other

Task 6. Equipment Electrical Operations:

Task: Warm up machinery and check first piece parts prior to operators/setters assigned to machinery.

6a. Warm up a multiple/s spindle machine
6b. Check first six (twelve) piece parts off a multiple
6c. Other

Task 7. Equipment & Tooling Lubricants:

Task: Check machine oil lubrication level and flow, and cutting tool oil level and clean screens; add oil/s when necessary.

7a. Check lubrication oil level in a multiple/s
7b. Check cutting oil level in a multiple/s
7c. Add lubricating oil when necessary
7d. Add cutting oil when necessary

Work-Based Learning Menu (page 2) Continued:

Please circle task numbers your shop would be most likely to assign apprentices to perform.

7e. Clean cutting oil screens
7f. Other

Task 8. Equipment Clutch & Hand Feed Mechanism:

Task: Check machines for stock up, reset and/or tooling adjustments.

8a. Check machine/s stock up status
8b. Stock up a multiple spindle machine/s
8c. Reset and/or adjust tooling of a multiple/s
8d. Other

Task 9. Service Setting for Bar Stock Size:

Task: Change collets, feed fingers and adjust collet tension.

9a. Install multiple spindle collets
9b. Install multiple spindle feed fingers
9c. Set collet tension
9d. Other

Task 10. Service Setting for Cycle Time:

Task: Install gears, cams and time machine.

10a. Install spindle gears in a multiple/s
10b. Install feed gears in a multiple/s
10c. Check cycle time of a multiple/s
10d. Adjust cycle time to layout specification
10e. Other

Task 11. Service Setting for Part Length:

Task: Install stock feed pusher cams.

11a. Install feed pusher cams on a multiple/s
11b. Set bar stop feed out length
11c. Other

Task 12. Service Setting for Accelerating Attachments:

Task: Install special machine tool attachments.

12a. Install threading attachments
12b. Install accelerating attachments
12c. Install cross drilling attachments
12d. Install turret milling attachments
12e. Other

Task 13. Set-Up a Multiple/s Spindle Automatic Screw Machine:

Task: Set holders, tooling, attachments and produce six (twelve) consecutive piece parts to blue print specifications.

13a. Set multiple spindle holders
13b. Set multiple spindle tools
13c. Set multiple spindle attachments
13d. Other

Work-Based Learning Menu (page 3) Continued:

6 **Please circle task numbers your shop would be most likely to assign apprentices to perform.**

Task 14. Common Problems & Solutions:

Task: Solve and correct common problems on multiple spindle screw machines.

14a. Identify and correct out of tolerance machine tool cuts
- 14a-1. Sharpen and reset worn tooling
- 14a-2. Adjust rough form cut sizes
- 14a-3. Adjust finish form cut sizes
- 14a-4. Adjust drill cut sizes
- 14a-5. Adjust ream cut sizes
- 14a-6. Adjust thread cut sizes
- 14a-7. Adjust thread roll sizes
- 14a-8. Adjust box tool cut sizes
- 14a-9. Other

14b. Identify and correct out of tolerance piece part finishes
- 14b-1. Correct rough form chatter
- 14b-2. Correct finish form chatter
- 14b-3. Correct tool bit cutting finish
- 14b-4. Correct drill cut finish
- 14b-5. Correct reamer cut finish
- 14b-6. Other

14c. Identify and correct machinery mechanical inconsistencies
- 14c-1. Correct short piece part feed out
- 14c-2. Correct inconsistent machine braking action
- 14c-3. Correct poor feed clutch engagement
- 14c-4. Correct threading clutch slippage
- 14c-5. Other

14d. Other

Task 15. Uncommon Problems & Solutions:

Task: Solve and correct uncommon problems on multiple spindle screw machines.

15a. Identify and correct unusual tolerance problems
- 15a-1. Identify material out-of tolerance conditions
- 15a-2. Correct worn cam roller
- 15a-3. Correct worn cam pin
- 15a-4. Other

Task 16. Tool Crib Tending:

Task: Distribute tools and other tool crib items; keep a daily record of distribution and acquire return of items at shift end when necessary.

16a. Distribute tools
16b. Keep daily records
16c. Acquire return of items
16d. Other

Work-Based Learning Menu (page 4) Continued:

Please circle task numbers your shop would be most likely to assign apprentices to perform.

Task 17. Lathe Work:

Task: Perform lathe machining of parts as designated.

- 17a. Machine reject parts
- 17b. Machine feed finger inserts
- 17c. Machine replacement machinery parts
- 17d. Other

Task 18. Machine & Shop Maintenance:

Task: Repair items as assigned.

- 18a. Replace broken chuck pins
- 18b. Replace broken chip conveyor chain links
- 18c. Repair inoperative shop vise
- 18d. Repair broken shop table
- 18e. Other

Task 19. Scrap/Chips & Material Handling:

Task: Perform material handling and related duties.

- 19a. Operate chip spinner
- 19b. Remove stock from carrier truck
- 19c. Deliver stock to machine stock rack
- 19d. Move parts pans from operators multiples
- 19e. Count operators parts at shift end
- 19f. Other

Task 20. Statistical Process Control (SPC):

Task: Apply SPC inspection applications.

- 20a. Perform SPC on several operating multiple spindle machines
- 20b. Perform SPC on several operating single spindle machines
- 20c. Perform SPC on parts in holding area
- 20d. Other

RICHARD J. DALEY COLLEGE

CUSTOMIZED TRAINING

Summary:

To help improve competitive position of manufacturing companies in the Chicago area, Daley College now offers customized training. This outreach program is off shoot from the Manufacturing Technology program and is designed to:

1. Provide training for present workforce development
2. Determine educational and training needs for future workplace
3. Provide input to insure effective curriculum for degree and certificate programs

We have already completed training for two companies and the plans are underway to start training for more companies.

1.0 General Training: We are working with the following companies to provide ~~equal~~ training in workforce development.

1. Craig Metal Craft, Inc.
   4724 West Rice
   Chicago, IL 60651
   (312) 921-3330

2. Mid-West Wire Specialties Inc.
   2704 W. Roscoe Street
   Chicago, IL 60618
   (312) 463-1199

3. ACME Consolidated, Inc.
   6151 S. State Street
   Chicago, IL 60621
   (312) 288-4100

4. Kraft General Foods
   7400 South Rockwell
   Chicago, IL 60629
   (312) 471-7571

5. Foote-Jones/Illinois Gear
   2102 N. Narchez Ave.
   Chicago, IL 60635
   (312) 622-8000

6. P-K Tool & Manufacturing Co.
   4700 W. Lemoyne
   Chicago, IL 60651
   (312) 235-4700

7. Wireformers, Inc.
   1723 N. Western Ave.
   Chicago, IL 60647
   (312) 486-6067

8. D.O. James/Chicago Gear
   2823 W. Fulton St.
   Chicago, IL 60612
   (312) 638-0508

2.0 Training Grant:

A. Prairie State 2000:
We have helped two companies to obtain training grant funds from Prairie State 2000.

1. ACME Consolidated, Inc.
   6151 S. State Street
   Chicago, IL 60621
   (312) 288-4100

2. Merit Machine Products
   5320 W. Grand Ave.
   Chicago, IL 60639
   (312) 745-0741

B. Secretary of State Literacy Grant:
We have helped five companies to program and file applications to the Secretary of State for literacy grant. The companies are:

1. Mid-West Wire Specialties Inc.
   2704 W. Roscoe Street
   Chicago, IL 60618
   (312) 463-1199

2. Craig Metal Craft, Inc.
   4724 West Rice
   Chicago, IL 60651
   (312) 921-3330

3. Foote-Jones/Illinois Gear
   2102 N. Narchez Ave.
   Chicago, IL 60635
   (312) 622-8000

4. P-K Tool & Manufacturing Co.
   4700 W. Lemoyne
   Chicago, IL 60651
   (312) 235-4700

5. Wireformers, Inc.
   1723 N. Western Ave.
   Chicago, IL 60647
   (312) 486-6067

3.0 ISO 9000

The college is part of the consortium of five other community colleges to put together a program in ISO 9000 training. The companies that have expressed desire to work with us are:

1. P-K Tool & Manufacturing Co.
   4700 W. Lemoyne
   Chicago, IL 60651
   (312) 235-4700

2. Triton Industries, Inc.
   1020 N. Kolmare Ave.
   Chicago, IL 60651
   (312) 384-7000

3. Litton Precision Gear
   4545 S. Western Blvd.
   Chicago, IL 60609
   (312) 847-4211

4. D.O. James/Chicago Gear
   2823 W. Fulton St.
   Chicago, IL 60612
   (312) 638-0508

5. Foote-Jones/Illinois Gear
   2102 N. Narchez Ave.
   Chicago, IL 60635
   (312) 622-8000

Rock Valley College

3301 NORTH MULFORD ROAD / ROCKFORD, ILLINOIS 61111 / (815) 654-4250 FAX 654-4459

June 4, 1992

TO: Susan
Mr. Tim Budd - College of Lake County
Dr. Dick Hinkley - Moraine Valley
Mr. Roger Luman - Bradley University
Mr. Prem Sud - Richard J. Daley College
Dr. Don Waters - Elgin Community College
Mr. Dan Wayne - Western Illinois University

FROM: Rolland Westra - Rock Valley College

SUBJECT: ISO Planning Meeting

An ISO-9000 planning meeting will be held at Elgin Community College on June 15th at 10:00AM.

The purpose of the meeting is to discuss an Illinois initiative to prepare trainers on ISO-9000 registration. Geoff Illsley from Bywater and Al Lesure from Learning Resources, Inc. will be present to discuss a training proposal.

Please advise Carole Smith (815/654-5500) of your plans to attend.

cc: Mr. Bill Brown - State of Ill. Office of the Governor
Mr. Jerry Burger - Ill. Dept. of Commerce & Community Affairs
Dr. Russ Hamm - College of Lake County
Dr. Kerry Kerber - Western Ill. University
Mr. Al Lesure - Learning Resources Inc.
Dr. Robert Weinstein - Bradley University
Jeff Hensley - By-waters.

Rock Valley College

3301 NORTH MULFORD ROAD / ROCKFORD, ILLINOIS 61111 / (815) 654-4250 FAX 654-4459

June 16, 1992

To: Mr. Jerry Burger, Dept. of Commerce & Community Affairs
Mr. Tim Budd, College of Lake County
Dr. Dick Hinkley, Moraine Valley
Mr. Geoff Illsley, Bywater
Mr. Al Lesure, Learning Resources, Inc.
Mr. Paul Lueck, Elgin Community College
Mr. Jerry Mytych, Dept. of Commerce & Community Affairs
Mr. Prem Sud, Richard J. Daley College
Ms. Susan VanWeeldon, McHenry County College
Dr. Don Waters, Elgin Community College
Mr. Dan Wayne, Western Illinois University

Subject: ISO-9000 Statewide Train The Trainer Initiative

The above persons met June 15, 1992 at Elgin Community College to discuss a statewide effort to train trainers to prepare the Illinois manufacturer for ISO-9000 registration.

The attached agenda prepared by Learning Resources was used to guide the meeting.

Significant comments made during the meeting:

- Approximately 300 firms are ISO-9000 registered in the U.S.
- Relationship between training and registration:
  * Company employees must be trained in what the standard requires.
  * A conforming quality system must be installed in the company.
  * Certifying bodies audit a company 2-4 times per year and must recertify every 3 years.
- Proposed Bywater Package (described in attachments).
  * Train twenty quality specialists (3 weeks of trainer training).
  * Trainers materials (video supported trainer package).
  * Ongoing site audits (3 site audits to 5 sites).
- Industrial Training Program Comments - Jerry Burger
  * ITP typically funds 50%.
  * Would look more favorably at the program if companies were lined up and committed.
  * Need to establish a relatively tight time line (trainer training this fall).
  * Would like to make available to industry at no "out of pocket cost" to them. Use employees time as a match.
  * Would have insight into budget direction around mid July.
  * Would prefer one grant to a lead institution but this is negotiable.

Action items from meeting:

- Prepare a personnel description to help identify candidate trainer qualifications. --Bywater
- Develop a model to evaluate and discuss. --R. Westra
- Establish a probable time frame for program. --R. Westra
- Identify potential client companies in each region. --all attendees
- Identify required number of trainers for each region. --all attendees
- Identify potential partners to form service regions. --all attendees
- Identify additional costs --R. Westra/LRI

In conclusion there appears to be significant interest by those attending the meeting. There appears to be substantial interest and commitment from the state. We are missing the concrete information about the potential market and we need to identify the service regions that are necessary to provide assistance to the interested manufacturers in Illinois.

I will follow up with those attendance in early July to assemble the information collected and plan the next step.

Sincerely,

Rolland O. Westra
Director
Technology Center

cc: Mr. Paul Ramos, College of DuPage
Mr. Roger Luman, Bradley University

June 15, 1992

Agenda: Regional Resources for ISO Registration for Illinois Industry

Date: Monday, June 15, 1992
Time: 10:00 - 1:30
Location: 1700 Spartan Drive, Elgin Comm. College, Elgin, IL
Host: Don Waters, Phone: 708-697-1000, Ext. 7377

Objective: To create a proposal that will fund the establishment of a network of regional resource centers where quality specialists have been trained to deliver high quality, reasonable cost training to industry in support of ISO 9000/Q 90 registration.

10:00 - 10:30 Review Background Document to ensure general agreement on:

- the magnitude of the problem.
- the nature of the proposed solution: conceptual or step-by-step and practical?

1. >> What is the goal? Establish regional resource centers so that 80% of IL industry will be within an hour's drive of a center, or...

10:30 - 11: 15 Participants, partners and champions:

LRI/Bywater: credibility, competence and resources (including an overview of the training curriculum by Bywater)

Lead college: Rock Valley College

2. >> Other sites: processes and responsibility for recruitment.

Attendees will make recommendations as to any additional regional sites based.

How do we effectively serve the Chicago area?

Vetting applicants for trainer training.

3. >> What other agencies/organizations should be recruited or informed of this initiative? (Chambers, Manufacturer Associations, Trade Clubs....)

4. >> Political sponsorship: are there politicians to recruit and or brief regarding this initiative?

11:15 - 12:00 The Proposal

Models: What recent proposals might serve as a model for this one?
Responsibility: Rock Valley and LRI
Schedule: Submit to whom by _____

5. >> Support required to develop the document?

6. >> 'Funding and procedural realities.'

7. >> State's review process and timing.

12:00 - 12:15 Break

12:15 - 1:15 Issues:

Budget: LRI/Bywater, Lead institution and support for participating colleges.

On-going costs: participant materials.

Quality assurance: regular audits.

Criteria for college participation: investment, regional partnering, marketing. Decision-making on who participates.

7. >> Should participating colleges be required to:

- Contribute $ _____ for each person trained?
- Establish a marketing plan describing how they will promote the program in their region?

- Identify firms within their region who, based on meetings, focus groups or survey, express interest in receiving training from regional deliverers of training?

State marketing support: roles and responsibilities.

8. >> How do we foster a strong working relationship between the sites and economic development, industry extension, manufacturing groups and...who else?

1:15 - 1:45 Close:

Confirm interest of attendees in participation.

Review actionable items; confirm dates.
Next meeting (in person or by phone).

Reminders/Issues to raise: _____

Meeting Action Items: _____

LEARNING RESOURCES, INC.

Summer, 1992

Concept Paper

ISO 9000 and Regional Resources to Support Industry's Registration

The Problem:

There is a dearth of proven, practical, accessible and affordable resources in any State to support small and medium-sized firms in their efforts to achieve ISO registration and/or TQM implementation.

The Opportunity:

To provide State-based industry with strategically located, regional ISO 9000 registration and TQM training resources; this will be done by:

- training and certifying quality specialists to offer programs and other resources and services in support of ISO registration;
- providing on-going support to the trainers and their customers via regular site visits/audits; and,
- coordinating this initiative through State Agencies and colleges.

Issues:

International markets and global competition have encouraged 51 countries — all of the developed world — to establish internationally recognized minimum quality standards which, effective 1/1/93 will significantly impact on the sale of industry's products and services worldwide. Specifically:

700 CANAL STREET, STAMFORD, CT 06902-6931

- US firms selling into European Community (EC) countries will increasingly compete with firms whose quality systems have been registered under ISO 9000;

- US suppliers to firms who have registered to ISO (or Q 90, the US equivalent to ISO) will be under increasing pressure to register. An example: last year, 50% of the supplier contracts issued by the German firm, Siemans, specified ISO registration as a condition of the contract.

- Unregistered US companies will be at a competitive disadvantage when competing within the US with any firm whose quality system has been registered.

ISO was accepted in many EC countries in 1987: 43% of Swedish firms are now registered, 37% of French firms and 16% of UK firms have registered. .5% of US firms are registered under ISO or Q 90; this figure will grow geometrically.

There will soon be a tidal wave of demand from US firms for assistance in the registration process. Currently, organizations gain support in the following ways:

- Large US firms have tended to rely on UK organizations and consultants: BSI, Handley Walker, the Victoria Group and Bywater provide customized, in-house consulting and training and public seminars.

Training related costs for the above are in the range of $350 to $400 per person per day of training.

- Others firms rely on local quality consultants. A typical profile of such a consultant is that s/he has often received only limited training on ISO. Very few consultants or consulting firms have actually helped take an organization through to registration.

The Proposal:

Working under the leadership of a lead institution and with the support of concerned State agencies, we propose to develop regional centers at which carefully trained specialists will offer high quality, proven and practical training to industry in support of ISO 9000 registration and TQM implementation. Specifically, we seek to:

1. Train 2 to 6 quality specialists from regions within the State, enabling each site to offer a validated four-course curriculum in support of ISO 9000 registration. Our goal is to have a resource site within an hour's drive of 80% of a State's industry.

2. Provide trainers with: training manuals and support materials, course materials for trainees and video-supported packages for firms to use as they apply the training and prepare for ISO or Q registration.

3. Support these trainers and their customers with regular, on-site visits and audits to ensure continuous quality improvement.

The Players:

A lead institution to support the recruitment of colleges within the state and provide contract administrator for this program. The lead site will be viewed within the State as a leader in support of economic development and business and industry training.

Colleges of similar capability and credibility will be recruited to form the regional network.

Learning Resources, Inc. (LRI): Our business is working with colleges in support of their community, economic and workforce development efforts. LRI has a long history of support of and work with the American Association of Community and Junior Colleges (AACJC). LRI has already arranged for a number of orientations to ISO and TQM at colleges and, in mid-October, working with the AACJC's Community College Satellite Network and our quality partner, Bywater, we will offer a two-hour program which colleges will re-market to local industry: the program will be a primer on ISO 9000.

Bywater is a UK firm with a long history of TQM and ISO 9000 consulting and training. A few comments on its background give insight into their experience and credibility and respond to a critical question: why Bywater?:

- In 1987, when ISO went into effect in England, British Standards Institute arranged to have their 235 quality auditors upgraded to the new quality standards: BSI chose Bywater to conduct this training;

- Bywater has helped 400 firms, worldwide, register under ISO 9000 - far more than any other training or consulting firm;

- Out of its ISO and TQM experience, Bywater has developed a four-course curriculum which is delivered in customized and generic versions. On the Continent, in Canada and elsewhere, Bywater has trained quality specialists from the accounting firm of Peat Marwick to offer its curriculum: Bywater has a track record of effectively training trainers; and, finally,

- Bywater has developed a unique set of video-supported training packages which provides step-by-step guidance as an additional resource for firms undertaking ISO registration.

The Cost:

Excluding costs of contract administration, college recruitment and trainers' training-related expenses, an estimate for the LRI/Bywater costs is $161,000 to provide:

- 3 weeks of trainer training (spread over a ten week period) to a total of 20 quality experts from 5 regional centers.

- trainer materials and 5 sets of Bywater's video-supported training packages. The discounted price of these packages is $5725/set. The packages represent $28,000 of the (above) total cost.

- 3 site visits to five sites. $6500 per site or a total of $32,500 is built into the budget. This will be an on-going, annual expense to participating sites after the first year.

Of the $161,000 for 5 sites, $97,000 is for training; this is a cost of $322 per person per day of training.

Value to the State:

1. State-based industry will have access to and on-going support for their cost-effective compliance with ISO registration and TQM implementation.

2. Once sites have been trained to offer our curriculum, industry will acquire training at about 1/3 the price they would pay from training vendors.

3. Participating colleges/universities will be trained to deliver a proven curriculum using tested, validated and state of the art resources in support of regional, not local, training requirements of industry.

4. Regular quality audits of training deliverers will ensure both high quality and continuous improvement of trainers and training.

5. By coordinating and strategically locating trainers, the volume and expense of trainer training will be reduced.

Introduction to TQM and the ANSI/ASQC Q 90/ISO 9000 Series

Purpose: Registration to an internationally recognized Quality System standard such as ANSI/ASQC Q 90 or ISO 9000 Series standard provides a significant national and international competitive advantage.

Registration provides customers with confidence in the organization's ability to meet their requirements. Going beyond the standards and introducing Total Quality Management -- TQM -- leads to further benefits in terms of improved financial performance, staff morale and reputation.

An effective Quality System is essential in meeting part of the requirements of the Malcolm Baldrige Award.

This one-day course is designed to provide attendees with an understanding of Quality Management, the options therein, what is required of the firm, the benefits and risks and how using the ByWORD Series for Total Quality Management can assist participants and their organizations.

Who Should Attend: Anyone considering implementing Quality Management or certifying to different Quality Standards -- ISO 9000 or others.

Program Outcomes: At the end of the day, attendees will have an understanding of Quality Management, what it involves and they will be able to:

- explain the concept to others in the organization;
- decide how Quality Management or Standards Certification can help improve their organization; and
- begin taking steps towards certification or introducing Quality Management.

Typical Program Outline:

Introduction and Objectives
What is Quality Management
Quality Management -- The Need and the Benefits
Quality Systems Standards (ANSI/ASQC Q 90/ISO 9000 Series)
Video: Strategy for Total Quality Management
The Total Quality Approach
Video: Establishing a Quality System
Introduction to the Baldrige Award
Video: Planning for a Quality System
Using the ByWORD Series for TQM
Review
Discussion

Learning Resources, Inc., 700 Canal Street, Stamford, CT 06902-5921; Phone: 203-637-5047

Planning and Implementing a Quality System

Purpose: A Quality System is a cornerstone of modern management and an important foundation for business improvement.

An effective Quality System cannot be established without the understanding, participation and commitment of all employees. Achieving this requires a clear strategy and detailed planning to balance an emphasis on both people and business process.

This four-day course is designed to equip attendees with the understanding and skills necessary for planning and managing the development and implementation of a Quality System that improves business performance and, as appropriate, satisfies ANSI/ASQC 90/ISO 9000 Series requirements.

During the course, attendees will develop an action plan which comprises all the essential elements for successfully implementing a Quality System that meting their organization's specific needs.

Who Should Attend: Those responsible for planning and managing an initiative aimed at introducing and maintaining a Quality System.

Course Outcomes: At the end of the program, attendees will understand what is involved with developing, implementing, maintaining and improving an effective Quality System; they will be able to:

- select the appropriate Quality System standard (if registration is an objective);
- determine the required scope of the Quality System;
- identify the organization's present level of control over critical activities
- determine which activities need to take place to develop and implement the Quality System and obtain employee commitment and involvement;
- decide resource requirement and identify constraints; and
- develop a detail action plan for their organization

Typical Program Outline

Day 1
Introduction and Objectives
What is Quality Management?
Quality Management: The Need and Benefits
Workshop: Identifying the Need
The Total Quality Approach
Video: Establishing a Quality System
Quality System Standards
Managing the Business Processes
Workshop: Defining the Business Process
Quality, People and Culture

Day 2
Interpretation of ISO 9000/Q 90
Quality System Documentation
Scope of the Quality System
Process Analysis
Workshop: Process Analysis
Process Control
Developing a Procedure
Determining the Present Level of Control
Video: Planning for a Quality System
Workshop: Planning the Quality System

Day 3
Video: The Case for Quality Cost Measurement
The Basics of Quality Costs
Survey of Non-Conformance Costs
Introduction to Quality System Auditing
Management Reviews of the Quality System
Workshop: Maintaining and Improving the System
Quality Education and Skills Training
Workshop: People and Quality

Day 4
Communicating the Quality Initiative
Video: Strategy for Quality Management
Developing the Action Plan
Workshop: Preparing an Action Plan
Review and Discussion

Learning Resources, Inc., 700 Canal Street, Stamford, CT 06902-5921; Phone: 203-637-5047

Documenting and Auditing a Quality System

Purpose: The development of an effective Quality System requires a clear strategy and detailed planning. It also requires that the organization possess the necessary skills for the documentation, implementation and maintenance of that System.

This five day course is designed to provide attendees with the required skills for documenting and auditing the Quality System.

Who Should Attend: Those individuals who must develop, implement and audit aspects of the Quality System that are relevant to their areas of responsibility.

Course Outcomes: At the end of the program, attendees will understand the important characteristics of a Quality System and be able to:

- analyze in detail the processes and activities that take place in their organization;
- determine which Quality System documentation is necessary;
- develop that documentation; and
- audit the implementation and ongoing effectiveness of the Quality System.

Typical Program Outline

Day 1
Introduction and Objectives
What is Quality Management
Quality Management: The Need/Benefits
The Total Quality Approach
Quality System Standards
Video: Establishing a Quality System
Defining the Business Procedure
Workshop: Defining the Business Process

Day 2
Process Analysis
Workshop: Process Analysis
Process Control
Workshop: Measuring Process Performance
Requirements of ISO 9000 Series Standards

Day 3
Scope of the Quality System
Quality System Documentation
Developing a Procedure
Workshop: Developing a Procedure
Issuing, Administrating and Controlling
Quality System Documentation
Workshop: Analyzing a Procedure

Day 4
Introduction to Quality System Auditing
Video: Quality System Audit
Workshop: Producing the Internal Audit Schedule
Conducting Internal Audits
Workshop: Preparing an Audit Checklist
Workshop: Deciding Activity Compliance
Workshop: Preparing Corrective Action Requests

Day 5
Roleplay: Audit Performance
Workshop: Audit Reporting and Follow-up
Management Review of the Quality System
Improving the Quality System
Conducting External Audits
Receiving Internal Audits
Review and Discussion

Learning Resources, Inc., 700 Canal Street, Stamford, CT 06902-5921; Phone: 203-637-5047

Training for Quality Managers and Supervisors

Purpose: A Quality System cannot be effective unless it is understood and accepted by all affected by it.

The goal of this Quality Education course is not only to create the necessary understanding and overcome barriers to change, but also to reinforce the attitudes necessary for everyone to participate in continuously improving the business. To achieve the desired results, the on-going education should be conducted by the organization's own staff.

This three-day course is designed to provide attendees with the necessary skills for conducting and coordinating Quality Education and Training in support of the organization's quality initiative. As part of the program, attendees are provided with material to use when delivering Quality Education/Training -- and guidelines on how to customize the material to their organization's needs.

Who Should Attend: The Quality Co-ordinator and personnel selected to conduct Quality Education/Training and facilitate the introduction to Quality Management. It is a prerequisite for participating in this program that attendees have participated in either Bywater's "Planning and Implementing a Quality System" or their "Documenting and Auditing a Quality System" program.

Course Outcomes: At the end of the program, attendees will be able to participate in the planning and delivery or the organization's Quality Education offerings. They will acquire an understanding of the skills needed to facilitate the successful implementation of the Quality Initiative on an ongoing basis.

Typical Program Outline

Day 1
Introduction and Objectives
The Need for Quality Education
The Education Program and Material
Learning Styles and Methods
Presentation and Facilitation Skills
Workshop: Education and Facilitator Skills
Customizing the Quality Education Material
Workshop: Customize the Quality Education Material

Day 2
Preparation for Presentation
Presentations of Sessions 1 - 4 and Feedback

Day 3
Presentation of Sessions 5 - 8 and Feedback
The Role of Manager and Supervisor
Review and Discussion

Learning Resources, Inc., 700 Canal Street, Stamford, CT 06902-5921; Phone: 203-637-5047

ISO 9000 and Marketing in Europe: Should U.S. Manufacturers Be Concerned?

By Mary Saunders, Director
Single Internal Market Information Service
U.S. Department of Commerce

Many myths have been perpetuated about the role of quality system registration and U.S. manufacturer access to the European market after 1992. The following discussion is reprinted from Europe Now, *a quarterly Commerce Department newsletter that tracks developments in the European Community and describes for U.S. firms the opportunities and challenges in the market.*

Myth No. 1

If my company is not registered as complying with ISO 9000 quality system standards we will not be able to sell our products in the EC after 1992.

ISO 9000 registration is not a legal requirement for access to the EC market. In EC product safety legislation, registration to one of the European standards equivalent to the ISO 9000 series—EN 29001-3—is cited as a component of the product certification process for gas appliances, construction products, commercial scales, telecommunications terminal equipment, and certain classes of personal protective equipment and medical devices. Planned EC legislation for pressure equipment, recreational craft, cable ways, and lifting equipment for persons also references EN 29000 compliance. For most of these regulated products, ISO 9000 registration is an alternative for product certification, not an absolute requirement. In fact, as cited in most EC legislation, quality system registration is neither mandatory—there are other paths to product certification—nor is it a stand-alone procedure. Manufacturer compliance with either EN 29002 or 29003 is usually combined with product-type testing at the design stage for full certification to EC legal requirements. Manufacturers need to review relevant EC product safety directives for specifics applicable to their product area.

Outside of regulated product areas, the importance of ISO 9000 registration as a competitive market tool in the EC varies from sector to sector. In some sectors, European companies may require suppliers to attest that they have an approved quality system in place as a condition for purchase. This could be specified in any business contract. ISO 9000 registration may also serve as a means of differentiating different "classes" of suppliers, particularly in high-tech areas, where high product reliability is crucial. In other words, if two suppliers are competing for the same contract, the one with ISO 9000 registration may have a competitive edge with some buyers. Sector and product areas where purchasers are more likely to generate pressure for ISO 9000 registration include aerospace, autos, electronic components, measuring and testing instruments, and so on. ISO 9000 registration may also be a competitive factor in product areas where safety or liability are concerns.

Myth No. 2

I must certify my product as being in compliance with ISO 9000 standards.

The ISO 9000 standards do not apply to specific products. They are generic system standards that enable a company, through a mix of internal and external audits, to provide assurance that it has a quality system in place that will enable it to meet its published quality standard. *What* is produced is essentially immaterial to the audit process. ISO 9000 registration is, in effect, a certification of the production process only. Therefore, registration to ISO 9000 is not indicated on the product itself, but can only appear on the product literature or advertising.

Manufacturers should be aware that ISO 9000 does apply to purchasing, assessment of subcontractors, and inspection and testing of purchased components. Procedures must be in place for verification and maintenance of purchased components, and for tracking lost or damaged components. Also, in some areas, European standards organizations are developing additional guidelines for the application of the ISO 9000 standards to specific product sectors, such as medical devices (EN 46000) and aerospace products (EN 2000 and EN 3042).

Myth No. 3

ISO 9000 registration can only be obtained by opening my manufacturing facility to an audit by a third-party entity authorized to perform this function by an EC member state government.

This is only true if you are undertaking ISO 9000 registration as a means of fulfilling *regulated* product certification requirements as specified in EC legislation. In this case, final approval and registration of your quality

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system must come from an organization authorized by an EC member state government to perform quality systems audits pursuant to the relevant legislation—a "notified body," in EC parlance. This does not preclude having the actual audit or audits performed by a U.S. entity that operates as a subcontractor to an EC notified body. Subcontracting rules have recently been agreed to among the EC Commission and member states, under which notified bodies can subcontract ISO 9000 audit activities as long as the notified bodies retain responsibility for audit assessment. Certification of a regulated product by a notified body automatically yields EC-wide acceptance.

In nonregulated areas, any audit and registration acceptable to your customer is appropriate, whether performed by a European or non-European entity. Manufacturers interested in obtaining ISO 9000 registration should always first make sure that the registration they receive is both necessary and acceptable to the customer. A registration obtained in one EC member state may or may not be currently accepted in other countries on a bilateral basis. However, there is a move in Europe to facilitate mutual recognition of quality system certificates. EC and EFTA representatives have already established a European Committee on Quality Assessment and Certification (EQS), which is intended to harmonize rules in this area and support mutual recognition of certificates. The European Organization for Testing and Certification (EOTC), created by the EC to encourage and coordinate the development of regional testing and certification arrangements in nonregulated areas, will also cover the quality area.

Myth No. 4

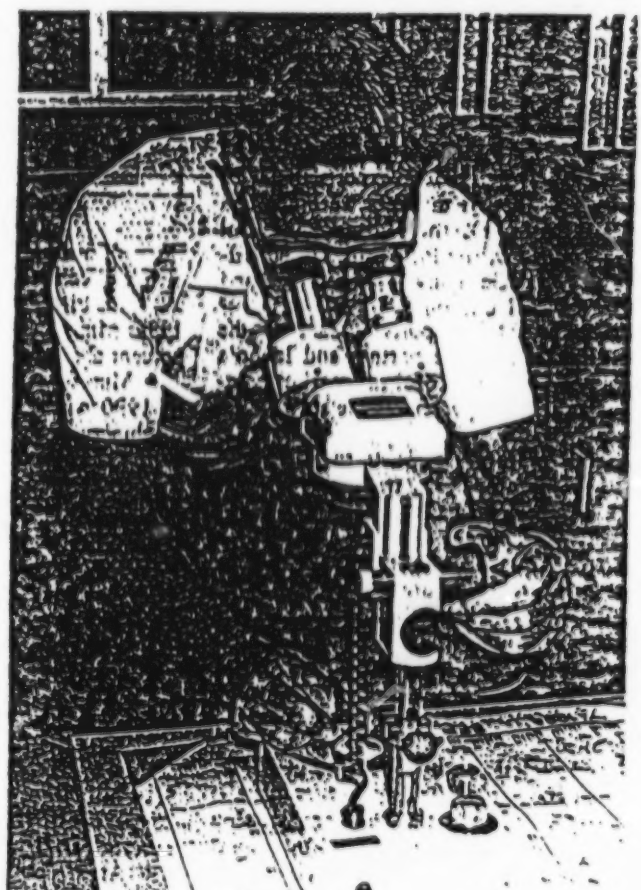
Any application of ISO 9000 standards requires third-party system registration.

ISO 9000 standards were originally developed for use in contractual situations such as those between the customer and a supplier. Quality systems requirements established by federal agencies in the United States, such as the Food and Drug Administration (for medical device manufacturers) and the Department of Defense (for military contractors), are operated as second-party certification programs. However, ISO 9000 certification as defined in EC legislation does establish third-party system registration as a requirement. This means registration by an authorized assessor or registrar who conducts an independent audit of an organization's quality system. On successful completion of the audit, the system is registered. Regular follow-up audits are conducted to ensure that the system is maintained. Many registrars also require a full re-audit after three to four years.

At this time, both the Department of Defense and the Food and Drug Administration are considering revision of the current quality system requirements to comply with ISO 9000. If this change takes place, both systems would still operate as second-party certification programs.

Additional information on EC testing and certification procedures and the role of ISO 9000 can be found in the guide on the topic prepared by the Commerce Department's Single Internal Market Information Service (SIMIS). Any questions about statements contained in this article should be directed to SIMIS at (202) 377-5276.

Information on ISO 9000 is available from the American Society for Quality Control at (800) 248-1946, the American National Standards Institute at (212) 642-4900, and the National Institute of Standards and Technology (NIST), Office of Standards Code and Information, at (301) 975-4040. NIST also operates five regional manufacturing technology centers, which serve as resource facilities to help manufacturers improve their competitive position through the application of manufacturing technologies. Several of these centers have sponsored workshops on ISO 9000. Manufacturers can contact these centers for information and assistance in the preassessment process for ISO 9000 qualification (call 301-975-3414 for more information.)



Many products made in the United States will have to meet EC testing and certification requirements to gain access to the EC market after 1992. As a result, quality control operations, as shown above, will become more important to U.S. firms. (Photo by Quality in Manufacturing Magazine*)*

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The Myths And Misconceptions

With so much emphasis on world competitiveness and quality, it is only natural that ISO 9000, the new international standard for quality, would receive a lot of attention. Unfortunately, there is much misinformation about what ISO 9000 is and what it will and will not do for an organization's quality efforts.

By Martin Ramsay, CPIM

By now you've probably heard of ISO 9000. You know it's coming, you know it has something to do with quality, you know you had better get ready. But how much do you really know?

Take this little test of your ISO 9000 knowledge:

(1) If a company representative tells you that his company is ISO certified, is he telling you the whole story?

(2) Can you be assured that products you buy from a company that is ISO 9000 certified are of the highest quality?

(3) If a company's ad says that the company is ISO 9000 certified, but doesn't tell the registering agency, should you accept the certification claim at face value?

(4) Is ISO 9000 the European version of the Malcolm Baldrige National Quality Award?

(5) Will ISO 9000 certification become a requirement for doing business in Europe within the next year?

The answer to each of the above questions is "No."

If you missed a few, don't be alarmed. Most people do.

People who talk a lot about quality know that ISO 9000 is important—but they often know little about it. Worse, there is an appalling amount of misinformation about what ISO 9000 is and what it will and won't do for an organization's quality. Let's get the facts out on the table and set the record straight.

ISO 9000 is a series of standards created by the International Organization of Standards (in French, the initials are ISO) to broadly define the components of quality. ISO is composed of many national standards organizations, of which the U.S. representative is the American National Standards Institute (ANSI). ISO representatives work out standards for a variety of commercial and scientific items; the 9000 series is just one of ISO's published standards.

The ISO 9000 series is actually five standards. ISO 9000 merely contains guidelines for selection and use of the other standards. ISO 9001 is the standard for quality for organizations that design, produce, service and install products and, as such, is the most difficult to meet. ISO 9002 is the same as ISO 9001, with the exception that it does not include the design and service of products. ISO 9002 is more appropriate, for example, for a manufacturing company that produces someone else's design, or for a factory whose design and service functions are done in some other location in the company. ISO 9003 is even more limited in scope, containing no standards for production; it would be more applicable to a warehousing operation. Finally, ISO 9004 contains guidelines for interpreting the other standards and, as such, is not a standard to be met; rather, it is a document to be used.

If a company tells you it is ISO certified, it isn't telling you the whole story. ISO is not specific enough; even claiming ISO 9000 certification is incorrect because ISO 9000 is only a set of guidelines. To be accurate, a company must say which ISO standard it meets: 9001, 9002, or 9003. And if a company that engineers, manufactures and services its products tells you it is certified to ISO 9002, you have to wonder why its design and service departments weren't evaluated accordingly.

Guidelines, not a guarantee

The most astounding fact about ISO 9000 is that it does not guarantee a company's product quality! The heart of the ISO standard is documentation and inspection. To receive ISO 900x certification, you must document what your company's procedures are for each element in the standard, and then be able to prove to a team of auditors that you are following your procedures. In the words of one ISO auditor, "I'm not going to tell you how to run your business. I'm just going to make sure you're doing what you say you're going to do."

Even if a company's procedures produce poor product quality, it can still receive ISO 900x certification, as long as the company follows its own procedures. The same auditor, describing the auditing process, noted that an auditor "will look at each element of the standard. Do you address it: yes or no? If you do address it, do you do what you say you'll

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do: yes or no? If you get a third party auditor who makes suggestions about how you should do something, he has way overstepped his boundaries." The one thing you can be sure about an ISO 900x certified company is that it will make its products consistently—consistently bad or consistently good, but consistently—because it is consistently following its documented procedures.

One company recently advertised in the *SAE Journal* that it was certified to ISO 9001. "Our quality system meets the internationally recognized standard for providing products and services that meet our customers' requirements the first time, every time." What's wrong here?

First, the ISO 9000 standards do not explicitly require that a certified company's products and services meet customer needs, nor that they do so the first time, every time. What they do require is that the certified company have a documented procedure for how it will deal with customers, ensuring that customer requirements are adequately defined and documented and that the company has the capability to meet contractual requirements.

Second, the ad did not state the company's certifying registrar. Registrars allow certified companies to use their logo in advertising (although they cannot affix it to their products), indicating under whose authority the ISO 900x certification was received. Without knowing the registrar, you have no way of checking the legitimacy of the certification claim.

Not only is the registering agency important, but who does the actual audit is, as well. "There are a lot of interpretation differences between auditors," says Roger Breisch, principal of the Webber Group, a quality consulting firm based in Wheaton, IL. He indicates that where one auditor may focus on factory floor processes, another may focus on human resource issues. "Different auditors have different experience in different industries," he adds.

A European Baldrige award?

Another source of confusion is the Malcolm Baldrige National Quality Award, which also addresses quality in an organization. Isn't ISO 9000 just the European version of the Baldrige award? Definitely not!

Because people believe that ISO 9000 guarantees product quality and because they see their competitors working on certification, a stampede is on to become certified. Rarely does a company ask if the certification is good for the company, or for their quality or for the world economy. Instead, they take the position that, like it or not, they have to do it.

First, ISO 9000 is not a European standard; it is an international standard. Second, the Baldrige award is just that: an award given to just a few companies every year who demonstrate a commitment to quality in everything they do. Where ISO 9000 focuses on procedures for the design, production and service of products, Baldrige focuses on satisfying customers, both internal and external. Both ISO 9000 and Baldrige contain standards and guidelines that can be used to make companies better, but the scope of Baldrige includes not only quality of products, but management systems, human resource systems, even accounts payable check-writing systems and telephone systems.

You could make the case that ISO 9000 is a subset of Baldrige—the part of Baldrige that focuses on product quality. In fact, achieving ISO 900x certification is a good way to begin to have the systems in place to think about applying for the Baldrige award. The difference between the two is highlighted in their respective terminology. Baldrige speaks in terms of approach, deployment and results. ISO 9000 checks to see that you document your procedures and follow them, preferably examining their effectiveness along the way.

A major midwestern university's recent announcement for an international ISO 9000 training teleconference claimed that "ISO 9000 standards for quality control will be mandatory for any company doing business within the European Community" by the end of 1992. The announcement goes on to claim that, "in the very near future, conformance to ISO 9000 will be a basic requirement for doing business." While common, these claims are very much overstated. In fact, very few countries or industries currently require ISO 900x certification.

The European Community (EC) has announced its intention to require that all machines sold in the EC in 1993 and beyond operate safely, and that ISO 9000 certification may be included in that requirement. The Department of Defense has indicated its intention, at some point, to require ISO 9000 certification of its suppliers, in place of the current MIL-Q-9858A specification. But these are all in the future.

What is really driving ISO 9000 is a kind of herd mentality—the same kind that causes stock market crashes and runs on banks. One director of quality for a *Fortune* 500 company put it this way: "Our competitors are surely going to be certified. In fact, one of them already is. Very soon, our customers may demand it. All other things being equal, suppliers with ISO 9000 certification will get the business. The market is demanding we become certified."

Because people believe that ISO 9000 guarantees product quality and because they see their competitors working on certification, a stampede is on to become certified. Rarely is the question asked, "Is this good for our company, or for our quality, or for the world economy?" Instead, the "like it or not, we have to do it" attitude prevails.

SO 9000 is not perfect

SO 9000 was designed by a committee f people who saw a need for a standard nd then created one. They did well; here is a lot of good in the standard. ISO 000 will probably help many compaies improve, not because it guarantees roduct quality, but because it enforces he discipline of documented consistency. When quality problems become consistent, they are much easier to solve. And many companies have a problem with self-enforced discipline. External forces like an ISO 9000 audit may accomplish what management cannot from within. It is somewhat amusing that ISO 9000 relies on using auditors to "inspect in" quality, a technique most manufacturers now reject in favor of quality that is "built in."

ISO 9000 is also useful because it provides a single, internationally recognized standard. According to Roger Breisch, this gives companies an opportunity to "insulate themselves from every individual customer's quality standards." Currently Ford, Motorola and many other companies have their own standards. For suppliers to these customers, meeting each standard can be an expensive and time-consuming process. "It will be better when all companies recognize ISO," says Breisch. "There is value in having one standard."

Self-examination is required

The problems with ISO 9000 are the misconceptions about what it can and cannot do. It guarantees consistency, not quality. Certainly consistency is the forerunner of quality. But, every company and every product is different. It would be ludicrous to think that a single standard could ensure quality in every case. Instead, the ISO 9000 committee wisely requires companies to know what they do and then that they do it, because this forces the company to examine what it does and why.

The bottom line is that, even with ISO 9000, the customer still has the responsibility to approve the quality of the products he is receiving. Having an ISO 900x certified supplier simply gives the customer the assurance that, once the supplier's quality is approved, that level of quality will be delivered consistently.

If companies pursue ISO 900x certification because they perceive it will give them a new marketing weapon, then ISO 9000 will become just another meaningless seal of approval that will soon fall by the wayside. If, on the other hand, companies use the ISO 9000 guidelines as a framework for self-examination, with the expectation of doing what's right for their products, employees and customers, then ISO 9000 will have been a very good thing.

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